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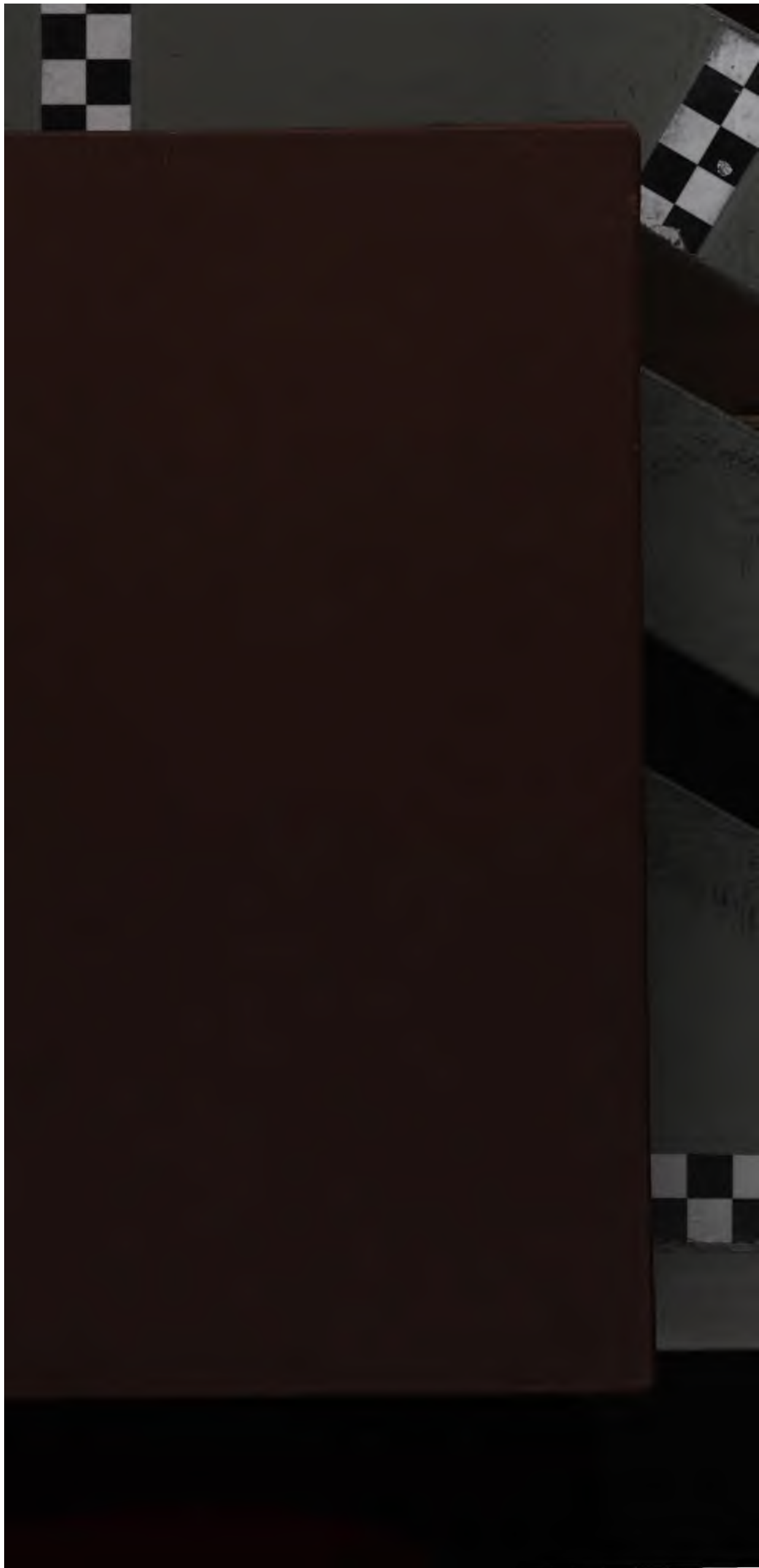
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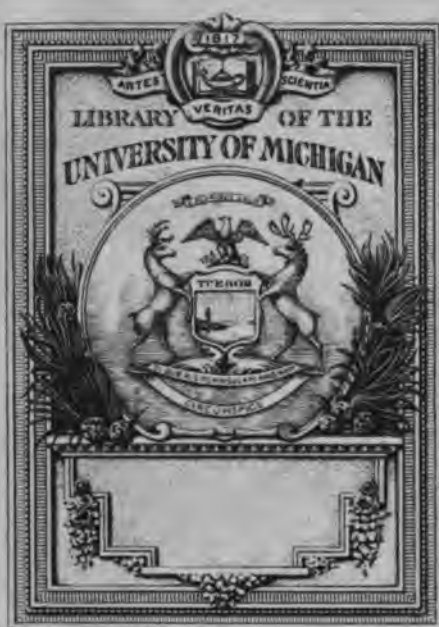
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THE
EARTH AND ITS INHABITANTS.

NORTH AMERICA.

BY
ÉLISÉE RECLUS.

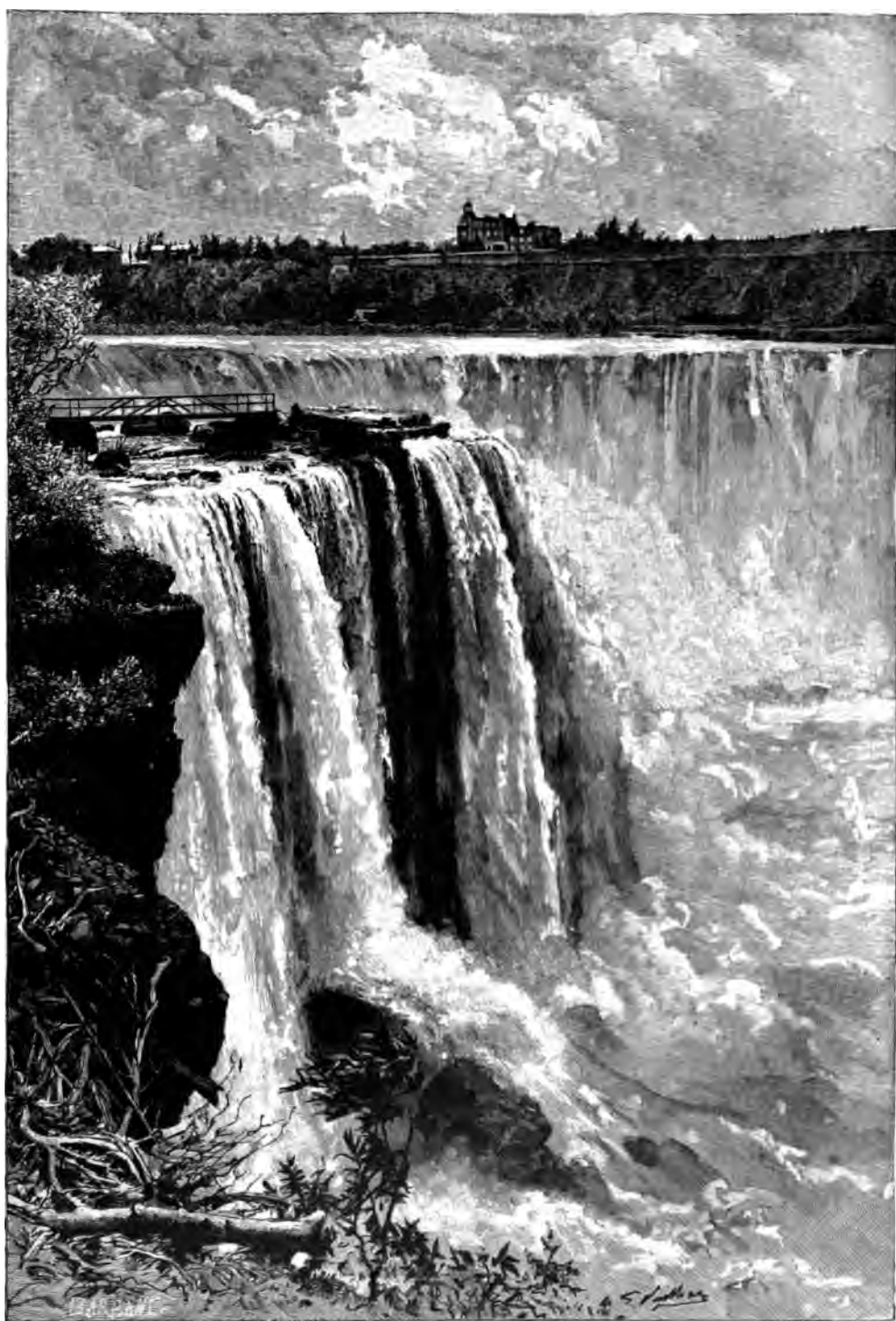
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VOL. I.
BRITISH NORTH AMERICA.



ILLUSTRATED BY NUMEROUS ENGRAVINGS AND MAPS.

NEW YORK:
D. APPLETON AND COMPANY,
1, 3, AND 5 BOND STREET.
1890.



THE HORSE SHOE FALLS, NIAGARA- VIEW TAKEN FROM GOAT ISLAND.



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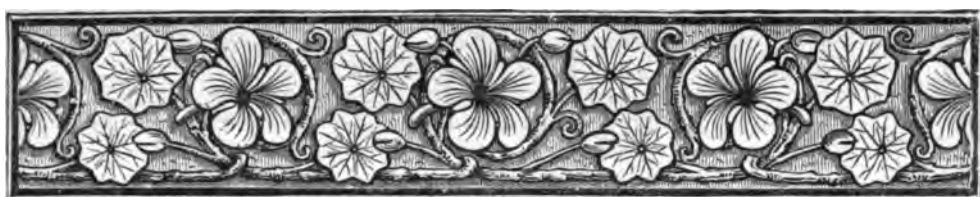
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THE EARTH AND ITS INHABITANTS.

BRITISH NORTH AMERICA, GREENLAND, ALASKA

CHAPTER I.

THE NEW WORLD.



UNLIKE the names of the Old World continents—Europe, Asia, Africa—that of America is shrouded in no mystery. The origin of the former has hitherto been a question of pure conjecture, whereas we know for certain that the latter, as applied collectively to the whole of the New World, dates from 1507, appearing for the first time in a publication issued in that year at Saint-Dié by the “Gymnase Vosgien,” a group of savants and printers constituted under the patronage of the Duke of Lorraine. It matters little whether this name, under its first form of *Amerige* (*Amerigen*), was introduced into the *Cosmographie Introductio* by the French translator, Jean Basin de Sandocourt, or by the Suabian Waltzemüller (*Hylacomylus*); the fact remains that, either by one or the other, the name was inscribed in the treatise in honour of Amerigo Vespucci, one of the first explorers of the New World, but also one whose fame is lost in the dazzling glory of Columbus. The Latin text is decisive as to the precise meaning given to the recently discovered regions; yet nothing can be advanced in support of the statement made so early as 1533 by Schöner that Vespucci had any direct relations with the Saint-Dié Society, and that he was base enough to claim the merit of the discovery by giving his Christian name to the New World. So far from this being the case Vespucci, like Columbus himself and all contemporary navigators, was unaware that his explorations had contributed to reveal any regions except those of the Asiatic Continent.

THE DISCOVERY.

In any case the name itself came but slowly into general use. The common appellation naturally continued for some time to be that which had been propagated by the mistake made by Columbus regarding the true character of the lands discovered by him. Having set out to reach the Indies he supposed he had rediscovered them, and the term India consequently continued to be applied to the New World both in current literature and still more in official documents. Even after further exploration had established the vast distance separating India and China from the Columbian lands, and after a clear distinction had been established between the "East Indies," reached chiefly by the oriental route, and the "West Indies," lying across the track of vessels sailing westwards, the Spanish Government persisted in designating as *las Indias* its trans-Atlantic possessions. Even to this day the term "Indians" is that which is still most commonly applied to the American aborigines, and in regions where the Spanish language prevails they are even called *Chinos*, or "Chinese."

On relatively few maps of the sixteenth century the new lands bear the name of America, or are even shown to be geographically independent of Asia. The first sheet of certain date on which the name itself occurs was engraved by Petrus Apianus in 1520, eight years after the death of Vespucci, and where the word elsewhere appears it is nearly always associated with others, such as Newfoundland, Brazil, Holy Cross, Atlantica or Atlantis, Peruvia, New Indies, and the like. It is obvious that no one designation had yet been sufficiently established to claim a decided preference on the part of cartographers. Not till the seventeenth century, over a hundred years after the discovery, did the term America acquire a definite predominance everywhere except in Spain. Its gradual adoption was clearly due, not to official pressure or to the influence of great writers, but to popular feeling itself, nor can there be any doubt that euphony had much to do with its favourable reception in the leading European languages. Thanks to its felicitous form it harmoniously rounded off the enumeration of the continents: Europe, Asia, Africa, America. Thus it happened, not for the first time in the records of humanity, that alliterative cadence contributed to perpetuate a manifest injustice.

In the face of authentic documents there might seem to be little room for doubt on the subject under consideration. Yet there already exists a copious literature composed by writers who have vainly essayed to assign a purely local origin to the name by which the New World is now designated. When certain erudite Teutons claim it as of German origin we may cease to be surprised that the Americans, on their part, feel a pleasurable gratification in researches which trace it to their native land itself. On several occasions certain resemblances have been pointed out between Vespucci's Christian name and the local designation of some American rivers or ranges, but no attempt was made to treat the question seriously till the year 1875, when the geologist, Marcou, suggested that the term was derived from the Amerrique Mountains, skirting the east side of Lake Nicaragua

between the towns of Juigalpa and Libertad.* This range, whose crests rise above 3,500 feet, forming part of the watershed between the streams flowing to Lake Nicaragua and the Blewfields river, is one of the largest in the Mosquito territory. Auriferous deposits occur in the eastern valleys of the range, which remained unknown to geographers till the year 1874, when mention was first made of it by the naturalist, Thomas Belt.† Marcou advances the hypothesis that, during the voyage of 1502 along the shores of the Caribbean Sea, Columbus, ever eager in the search for treasures, heard rumours of these goldfields, which lay about 100 miles inland, and which belonged to a tribe of like name, who may have traded with the coast. Amerigo Vespucci would appear to have twice visited the Mosquito seaboard, and may have also heard of the mines of the Sierra Amerrique, whose name was afterwards extended to the whole continent.

But all this is pure hypothesis, although it has pleased the vanity of local patriotism, and has, in fact, been adopted by several American authors. One of these, however, writing under the various names of Hurlbut, Byrne, de Bris, and Lambert, claims for the term America a more illustrious origin, tracing it to a word in the language of the Incas, meaning the "Great Land of the Sun," or the "Holy Land."‡

The first discoverers, amongst whom was Vespucci himself, could scarcely avoid using the expression, "New World," without thereby necessarily implying that America was geographically distinct from Asia. Nevertheless it is in this latter sense that the expression has been perpetuated to the present time, nor can it be denied that it is sufficiently justified by the comparatively brief interval that has elapsed since the American populations have entered into the common history of humanity. But the same can scarcely be said of another expression, that of the "Western" World, which is also occasionally applied to the American continent, but which is purely relative and true only in a transitory sense. In many respects, and especially in its relief, the form and disposition of its seaboard, America should rather be called the "Eastern" continent, for it lies east of the Old World, with which it is connected by the islands, peninsulas, marine beds, and pack ice of the Bering Sea.

Taken as a whole, the American mainland constitutes, in fact, a geographic unit, disposed in a vast semi-circle around the eastern shores of the Pacific Ocean. The Capes of Good Hope and Horn terminate on either side the immense amphitheatre of the continents, which follow in succession round the abysmal waters, and which raise their loftiest crests in proximity to their oceanic seaboard. The main relief of the earth's crust may in a general way be regarded as disposed in a continuous semicircle, sweeping round the great marine basin of the globe, the African and Asiatic highlands constituting the western, the American the eastern arc of this mighty curve, where the ranges of Alaska and British Columbia merely form a prolongation of those of Manchuria and Kamchatka.

* "Sur l'Origine du nom d'Amérique," in the *Bul. de la Soc. de Géographie*, vol. ix.

† *The Naturalist in Nicaragua*.

‡ "The Origin of the Name of America," in the *Bul. of the Am. Geograph. Soc.*, 1883, No. 1.

And within the circle of mountains now quiescent there is developed a second circle of active volcanoes, whose fiery curves are disposed in festoons connecting the Indonesian archipelagoes with the Asiatic seaboard, and at last merging in the western coast ranges of the American highland systems. Evidently the volcanoes of the New World form part of the same "fiery circle" as the flaming craters of the Philippines, of Japan, and the Kurile Islands, of which they form in fact the eastern section. In exceptionally clear weather the most westerly headland of North America is visible from the extreme north-east promontory of Asia across the intervening strait scarcely 60 miles wide. The Aleutian Islands also stretch from the Alaskan Peninsula for hundreds of miles towards the Asiatic mainland, while in winter the opposite shores of the two worlds are connected by irregular masses of pack or floating ice roughly thrown together by the contending currents, counter-currents, and eddies of the Arctic and Pacific Oceans. Even in mid-summer steamers at times find it difficult to force their way in the intervening strait through the drifting fragments of these glacial masses.

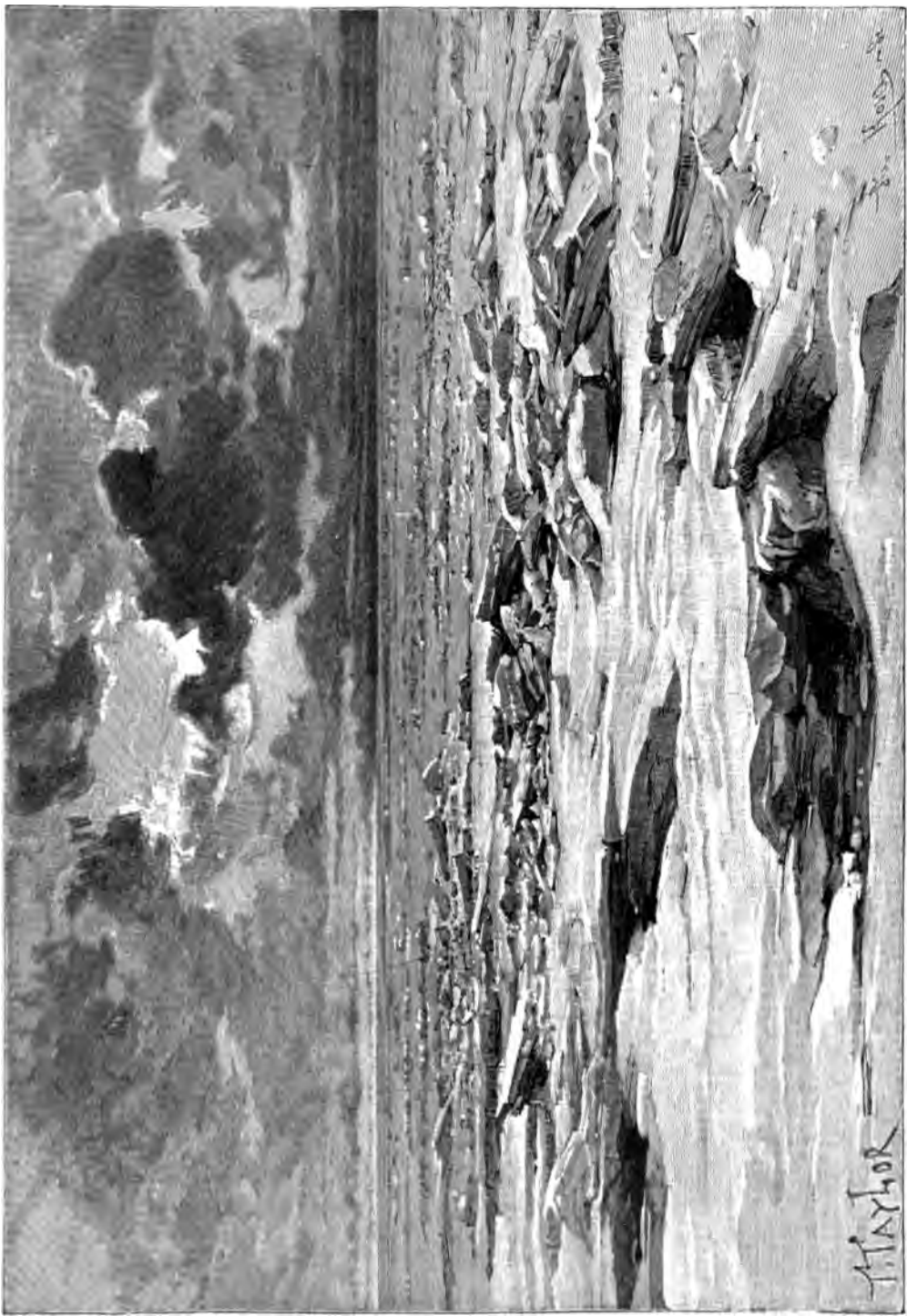
The Bering Strait itself has an extreme depth of not more than 30 fathoms, and even far from the coast whalers find good anchorage in depths of little over 20 fathoms. In the very midst of the strait itself rises the group of the Gvozdeva or Diomedé islets, serving as an intermediate station for men and animals passing to and fro between the continents, from Cape East on the Asiatic to Cape West (Prince of Wales) on the American side. Hence, as already remarked by Adalbert de Chamisso, the geodetic triangles of the Old World might easily be connected with those of the New World, which in fact forms its eastern prolongation.

On the other hand America is separated from European lands by a space of 900 miles across the narrowest part of the North Atlantic. Nevertheless the striking analogy of the rocks between Labrador, Greenland, the northern archipelagoes and Norway, justifies the hypothesis that at some remote epoch all these regions formed continuous dry land. Greenland is still united with Scotland, and Cape Wrath with the Lindsnes by a submarine bank less than 350 fathoms deep.

Historically also America is largely a dependency of Asia, and should consequently be regarded as an eastern land. The Asiatics had no need to discover America, nor the Americans Asia, seeing that where they approach nearest the continents are visible from shore to shore. Even without the aid of kayaks (boats) the natives of both regions have been able to cross to the opposite sides of Bering Strait. South of this strait the seaboard is indented with numerous inlets as far as Oregon, all affording refuge to Asiatic craft drifting eastwards; hence the statement that the American continent "turns its back on Asia" does not apply to the northern section of the New World.

Although contested by Rink, Morton, and other anthropologists, the view is now generally accepted that the hyperborean populations of America are of Asiatic descent, and along both sides of Bering Strait the resemblance of physical types, speech and usages is such that their racial unity can be scarcely called in question.* Consequently those who regard the kinship of the Eskimo and Mongoloid Siberian

* Chamisso, Waitz, Peschel, Petitot, Whympet.



VIEW TAKEN ON THE BERING SEA.



as established naturally infer the western or Asiatic origin of the populations occupying the northern section of North America. Polynesian influences are also recognised in the customs, structures, and ornamental work of the islanders along the north-west coast of America from Alaska to Oregon. Moreover, the "Black Stream" which traverses the North Pacific has frequently carried Japanese flotsam to the opposite seaboard; over sixty instances of this sort have been recorded since the beginning of the seventeenth century.* The same current has even occasionally borne junks and shipwrecked crews from one continent to the other, as, for instance, in the year 1875.

Some authorities even go so far as to assert that the Buddhist propaganda, and consequently Asiatic civilisation, exercised a direct influence on the inhabitants of Mexico and of Central America during the first centuries of the Christian era. Amongst the sculptures of Copan and Palenque mystic images have been found closely resembling those of Eastern Asia; such especially is the *taiki*, the most venerated symbol of the Chinese, which, according to Hamy, represents "the combination of force and matter, of the active and the passive, of the male and female principles." But, whatever is to be said of these pretended Buddhistic influences, there can be little doubt that the earliest transoceanic relations of the American continent must be referred, not to Europe or Africa, but to Asia, that is, to the West.

The case, however, is reversed when we come to the recent history of the New World. If in remote ages the march of civilisation or immigration was from west to east, its direction has been from east to west, from the Nile to the Mediterranean, and thence towards the ocean, and from the eastern to the western shores of the Atlantic, within the strictly historic period. Attempts have even been made to reduce this western movement of the cultured peoples to a fixed principle. "Westward rolls the star of empire," is a familiar saying amongst English-speaking nations. Anyhow, the fact remains that throughout modern times America has been, relatively to Europe, emphatically the western world, the "West" in the simple language of British seafarers. Beyond the Mississippi the vast plains and highlands stretching away to the Pacific Ocean are also commonly designated by the name of the "Far West."

Possibly at some remote epoch vessels from the eastern hemisphere may have reached this western world. Mention has been made of Phœnician navigators, and the Greek legends have been revived touching the mythical land of the Atlantes. Reference is also still made to the old Welsh traditions regarding Madoc ap Owen's discovery of the western lands wrapped in the perennial fogs of the great ocean. The Irish have similar legends, such as that associated with the name of St. Brendan; but the marvellous accounts of their bards are unsupported by a single fact which could give them a character of certainty.

The first authentic documents on the existence of a new world beyond the Atlantic date no further back than about a thousand years ago, coinciding with the epoch of the great Scandinavian migrations. Even in Italy itself, jealous of

* Brooks, *Comptes Rendus de la Soc. de Géographie*, July, 1886.

the fame of Columbus and Vespucci, no writer any longer doubts that North America was discovered by the Norse seafarers. The northern waters, scoured in all directions by the fearless Vikings, naturally offered the greatest facilities for exploration and conquest, for here the opposite seaboard of the Old and New Worlds approach nearest to each other. Since the time of the Greek navigator, Pytheas, these seas were doubtless much dreaded, owing to the dense fogs moving along the surface like whitish walls. Seafarers also feared to penetrate through the "nostrils of the earth" amid the ice-encircled shoals and waters half solidified by those masses of unmolten snow which gave rise to the legend of a "Viscous Ocean," or "Sea of Glue." Vague reports described the northern seas as shallow lagoons, or even nothing more than vast morasses, or else *Troldboten*, or a region of magicians haunted by supernatural monsters. Nevertheless, a belief also prevailed that beyond this world of spirits there stretched the shores of continuous land. On all the charts inspired by the geography of Homer the great "Ocean Stream" is represented as encircled by a narrow margin of coastlands.

But, whether the land designated by the ancients by the name of *Ultima Thule* is to be identified with Iceland or the Färoe Islands, there can be no doubt that this familiar station had long been known as a natural starting-point for the discovery of the western continent. The Irish monks, settled in Iceland towards the end of the eighth century, were followed a hundred years later by the Scandinavian Gardas, from whom the island received its present name. At that time two-thirds of the extreme northern waters had already been traversed, and here the Norse mariners also possessed the intermediate stations of the Shetland, Orkney, and Färoe archipelagoes. Navigators frequenting the seas between these insular groups could scarcely fail sooner or later to reach the shores of Greenland, driven westwards by storms or marine currents. As early as the year 977 Gunnbjörn sighted from a distance the snowy crests of a western land, and gave his name to some rocky heights or headlands projecting from the shores of the New World. Five years later Erik the Red, banished from Iceland for murder, sailed in the direction of those remote mountains of Mid-Jokul, and on a subsequent voyage built himself a fortified dwelling on the coast of the west, beyond the Hvarf or southern point of the great land. Although not yet identified, the ruins of this stronghold of Brattablida may one day perhaps be found on the Igaliko fjord, erected here over nine hundred years ago.

Ever since the arrival of Erik Greenland has always had inhabitants of European origin, and direct relations have been maintained at various epochs between the Scandinavian settlers in the west and the mother country. The Christian communities administered by the Sec of Greenland were even tributary to Rome, and the ecclesiastical annals make mention of furs and walrus ivory regularly shipped to Europe in payment of the "Peter's Pence." The Crusades themselves were preached in these Arctic lands,* and even after the occupation of the West Indies and mainland by the Spaniards the Norse bishopric of Gardar continued to be maintained in Greenland. Nevertheless, during the course of centuries the rela-

* P. Riant, *Expéditions et Pèlerinages des Scandinaves*.

tions became constantly less frequent between the opposite coasts of the North Atlantic. For some time after the discovery the spirit of adventure and conquest was kept alive amongst the intrepid Norse seafarers. Impatient of control the young men took to the high seas in order to escape the oppression of their rulers, and in their turn to found new states on those distant shores. But in the year 1261 Greenland fell under the direct political sway of the king of Norway; trade became a royal monopoly; expeditions across the Atlantic consequently grew less frequent, until at last both the Danes and Norwegians completely neglected those transmarine colonies which had been acquired by their enterprising forefathers.

South Greenland had not been the only western region discovered by the Norse explorers. Various expeditions had coasted the west side of the great island beyond 72° north latitude to the points where were found the human habitations lying nearest to the pole. But their voyages of discovery were directed chiefly to the south of Greenland. Even before the year 1000 Bjarn Heriulfson, who was sailing towards Greenland, had taken a too southerly course, thus sighting some forest-clad hills, which probably formed part of the American continent, but which he did not venture to approach. He was followed by Leif, son of Erik the Red, who first discovered the desolate ice-bound stony region of Hellu-land, which should probably be identified with the Labrador coast, although referred by most Scandinavian writers to the island of Newfoundland. He then pushed farther southwards to a wooded coast, which he named *Markland*, and which is supposed by Rafn, Kohl, and others to be the seaboard of Acadia or Nova Scotia. This view has been generally accepted by the commentators on the Norse Sagas, who identify the present Rhode Island between 41° and 42° north latitude with the Vineland also discovered by Leif at the end of the year 1000. An "inscribed stone" is even shown on the banks of the Taunton River opposite the village of Dighton in Massachusetts, which the interpreters tell us relates the conquest of the surrounding territory by Thorfin of Iceland.* It is obvious, however, that a passage in the old Norse texts referring to the length of the day in Vineland has been interpreted by Rafn in a sense too favourable to the importance of the discoveries made by his fellow-countrymen on the east coast of North America. All things considered, the Vineland of the Norse records should more probably be placed about the northern limit of the range of the wild vine, that is, in Nova Scotia or New Brunswick, where also grows the "wild wheat" (*zizania aquatica*), mentioned in the same records.†

But however this be, the fact is placed beyond all doubt that the Scandinavians founded regular colonies on the American mainland, the annals of which cover a period of from a hundred to a hundred and thirty years. After taking possession of the land by kindling great bonfires, which proclaimed their arrival far and wide, it was their custom to set their mark on the trees and rocks, to plant their arms on the headlands and to erect strong houses and outposts at their stations. The Sagas also speak of children born in these settlements, as well as of conflicts and of

* Rafn, *Antiquitates Americanae*.

† Haliburton, *Proceedings of the R. Geo. Soc.*, January, 1885.

warriors killed in battle; graves also are amongst the remains of the old structures attributed to these Norsemen. Like all subsequent European invaders, the Vikings massacred the natives for the sole pleasure of shedding blood, so that the work of extermination began with the first arrival of the whites. The old accounts, however, which were handed down from mouth to mouth, diversely intermingled truth and legend, and many stirring episodes appear to have been inspired only by the love of the marvellous.

One of the northern regions discovered by the Vikings, and since rendered uninhabitable by the cold, bears the name of Furdustrandir ("Wonder-strand"), so named from the strange visions conjured up by the evil genii of the place. According to the legend, the new arrivals had to contend not only with the Skrällinger—a general name indifferently applied to all the aborigines whether Eskimo or Redskins—but also with white populations, or peoples "dressed in white," that is, certain Irish Christians living on the southern coastlands, or in the interior towards the west. To this region, placed somewhere on the New England seaboard, was given the name of Hvitramannaland ("White Men's Land") or Irland it Mikla ("Great Ireland"). But if the Sagas that have been handed down to our time contain much that is marvellous, they probably comprise but a small part of the real history of the Scandinavians in America. It is at least possible that a strain of Norse blood may still survive, even beyond Greenland, amongst the indigenous populations of the New World.

After the Scandinavian explorations in the northern waters, the attention of the South European seafarers was mainly directed to the temperate and tropical regions beyond the Atlantic. The memory of the earlier expeditions appears never to have been entirely lost, or rather became intermingled with traditions of diverse origin. Like the Welsh and Irish, the Arabs had also their legendary navigators, the eight *Almagrurim*, or "Wandering Brothers," who had sailed from Lisbon in the year 1170 under a vow never to return until they had reached the remote isles beyond the seas. Other "brothers," Frisians by birth, were rumoured to have soon after embarked at Bremen, and to have reached Greenland. Towards the end of the fourteenth century two Venetians, the brothers Zeni, visited the same region, by them called "Engroneland," and the particulars recorded by them, as well as certain details of their charts, leave scarcely any doubt regarding the truth of their narrative. Lastly, the Pole, John of Szkolno was sent straight to Greenland in the year 1476 for the express purpose of reopening the communications that had so long been interrupted.

Undoubtedly the report of all these voyages had spread from seaport to seaport, as attested by the contemporary marine charts, on which coastlines, although traced at haphazard, were at least justified by popular report. Moreover, the recent discoveries of Madeira, the Canaries, and the Azores in the Atlantic southwest of Europe, had been more or less confused in the imagination of seafarers with the ancient traditions regarding the "Fortunate Islands," and with the Christian myths about other islands inhabited by saints. All these scattered

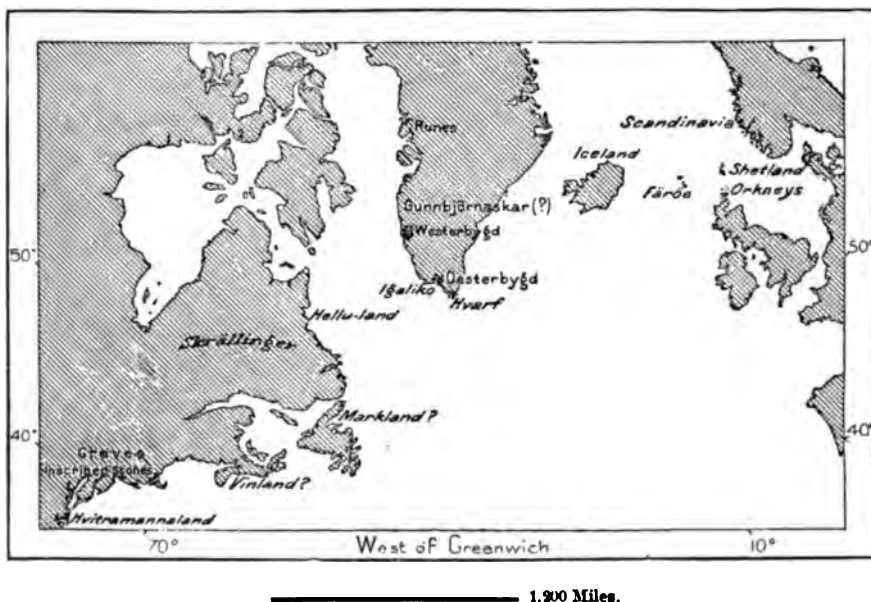
* Beauvois, *La Découverte du Nouveau Monde par les Irlandais*.

archipelagoes could not fail to awaken visions of other still more remote islands, all the more that unknown plants, berries, and other flotsam were brought with the currents and cast ashore at various points. At Flores were thus stranded two dead bodies, whose features in no respect resembled those of the inhabitants of the Azores.

One of these visionary lands, compared by Columbus himself to "the illusion of a mirage," was the island of Saint Brendan, which was sought in every part of the Atlantic, and even in the Indian Ocean itself. Then the *Sete Cidades*, or island of the "Seven Cities," colonised by the followers of the seven legendary bishops, who had been expelled by the Moors from Portugal, had at last been identified with San Miguel, largest member of the Azores, where is now to be seen the lagoon or "cauldron" of the seven cities. Antilia, another holy island, regarded

Fig. 1.—DISCOVERIES OF THE NORSEMEN IN THE NEW WORLD.

Scale 1 : 60,000,000.



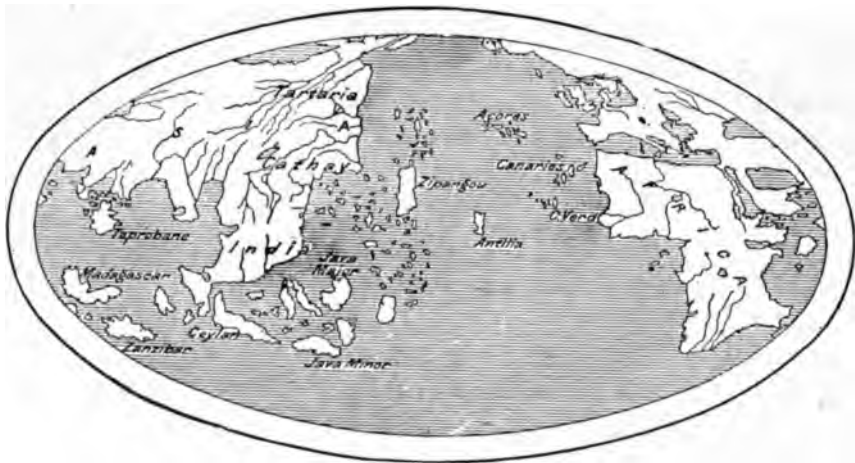
at one time as distinct, at another associated either with Saint Brendan or the Seven Cities, continued to shift from place to place until it eventually gave its name to the Antilles. Lastly, beyond the island of Brazil (*isola de Brazi*), supposed to have been found in the Azores, where a hill in Terceira still bears the name of Brazil, search continued to be made for the land of *Verzin*, or "Brazil Wood," a term which was universally applied to the vast region of Santa Cruz soon after its discovery.

The mathematicians on their part also endeavoured to penetrate the mystery of the equatorial sea by attempting to define the limits of the space comprised between the western shores of the Old World and the eastern seaboard of China. Thus, eighteen years before the discovery of the "West Indies" by Columbus, the

Florentine astronomer, Toscanelli, was requested by a person at the court of Affonso V., King of Portugal, to prepare a nautical memoir, according to which the city of Quinsay (Hangcheu), capital of the powerful empire of Cathay (China), was situated only 130° of west longitude from Lisbon. Between these two points the Atlantic and the sea now known as the Pacific Ocean were merged in a common marine basin. Off the east coast of China this space was further diminished at least 25° by the great insular kingdom of Zipangu (Japan), a wrong interpretation of a passage in Marco Polo having enormously exaggerated the width of the strait flowing between China and the Japanese Archipelago. The Chinese miles (*li*) of the text had been changed to Italian miles, and Zipangu was thus removed eastwards to the position really occupied by California, or even still farther east to the Rocky Mountains.

Toscanelli's now lost chart, which doubtless differed little from that of Martin Behaim still extant, also indicated the island of Antiglia as a station lying midway

Fig. 2 — FORM OF THE OCEAN ACCORDING TO TOSCANELLI, MARTIN BEHAIM AND COLUMBUS.



on the ocean route, which route might be further diminished by taking one of the western Canaries as the starting-point, as, in fact, was done by Columbus. Nay, more, contemporary astronomers held different opinions regarding the exact size of the degree comprised between two meridians, and, according to most of them, this space was considerably smaller than the determination made by Eratosthenes seventeen centuries previously.

One of the chief authorities quoted by Columbus in justification of his daring enterprise was the apocryphal book of Esdras, according to which the sea covered only a seventh part of the planet. The vast expanse of waters between Europe and Asia had obviously shrunk to very small proportions in the eyes of contemporary navigators, and herein lies the explanation of Columbus's remark: "*El mundo es poco!*" "The earth is small!" Fortunately ignorant of its real size he dared to sail, as he thought, for India, "seeking the east by the way of the west." He would doubtless have shrunk from the enterprise had he known that the actual

distance from Lisbon to Zipangu by this western route was some 210° of longitude, that is, far more than half the circumference of the globe. In the language of d'Anville, "the greatest of errors led to the grandest discovery." Still this event would have in any case been delayed but a few years longer, for Alvarez Cabral, following the track of Vasco de Gama towards East India, unexpectedly struck the Brazilian seaboard in the year 1500.

But the failure of Columbus to reach the goal he had proposed to himself helped only to enhance the greatness of his glory. For he thus discovered a new world, and as he said himself when relating a dream, "he took the keys of the heavy chains which held the sea imprisoned." The world hitherto supposed to be flat he proved to be round, and thereby opened the modern era of history. His rivals overwhelmed him with outrages, he was treated as a vain boaster, an impostor (*homem fullador*), "whose words were idle"; then his enemies charged him with treason and brought him back in chains across the very ocean which he had been the first to traverse. But after his death a reaction set in, and by a natural tendency in the mind of man numerous writers attributed the exclusive glory of the discovery to the daring genius of Columbus. But despite all exaggeration his genius was still shown to be of the first order by his many observations on the winds, the marine currents, the declination of the compass, and the confidence with which he had boldly plunged into the unknown "sea of darkness."

Nevertheless, the prominent part taken by Columbus in the progress of his times should not blind us to the merits of so many other fellow-workers; least of all should it induce us to discover in him every virtue under the sun, as if breadth of intellect and fortune's favours were still accompanied by all the higher qualities of the heart. Amongst the less fortunate contemporary navigators some might perhaps be mentioned who were fully equal to Columbus in scientific knowledge, and others who were certainly actuated by more disinterested motives. But it ever happens that, where multitudes of men contribute wittingly or unwittingly to one great result, some one favoured person arrives at the right moment and resumes in himself all the merit of the common work. Thus in the present case amid numerous competitors the name of Columbus stands out conspicuously as summing up his epoch, and the year 1492 is henceforth regarded as the parting-line between two eras of human progress.

At first the arrival of Columbus's caravals in a roadstead of the New World seemed but slightly to affect the political and social relations of the civilised peoples. On the other hand great events, such as the fall of the Eastern Empire, the artistic and literary triumphs of the Renaissance, the invention of printing, the circumnavigation of Africa, were also facts of vital importance, largely contributing to the evolution of thought which brought mediæval times to a close. But among all these indications of the profound change then taking place there was not one whose significance was more marked or richer in future promise than the fortunate voyage of the Genoese navigator. Thenceforth the Old World, itself not yet entirely discovered, ceased to constitute the whole inheritance of

man. Civilisation, which from the early empires grouped round the converging point of Europe, Asia, and Africa, had hitherto spread almost exclusively along the Mediterranean seaboard, and thence to the inlets and islands of Western Europe, now, at last, possessed the whole surface of the globe as its proper sphere of action. The sum of knowledge and, consequently, the domain of thought had been enlarged; history, till then fragmentary, began to assume a universal character; the still distant days that shall witness the alliance of all the peoples in a common humanity were already foreshadowed in the dim future. Such was the more or less clearly perceived source of the joyous emotion which filled all hearts at the news of the great discovery. The beauty, the rich vegetation, the climate of the recently revealed lands also largely contributed to lend additional lustre to the great event. If the voyages of the Norsemen to Greenland, Markland, Vineland, had already been forgotten outside scientific circles, while the first sight of the Antilles has remained in the memory of the nations as the only true discovery of the New World, must not the contrast be in a measure attributed to the lovely skies of the tropics? Compared with the marvellous southern isles, of what account were the ice-bound lands of the polar circle and the snow-clad northern rocks wrapped in eternal fogs?

During his first explorations Columbus failed to reach the mainland of the New World. The first islands sighted by the Europeans in 1492 after a journey of thirty-four days from Gomera, one of the Canaries, was a mere coralline plateau, whose native name, Guanahani or Guanahanin, was re-named San Salvador by Columbus's associates "saved" from the abyss. But this name was again changed either to Great Turk Island, or Cat Island, or Mayaguana, or more probably Watling Island, for it is still somewhat uncertain what was the first land actually reached by Columbus after his memorable journey.* In any case he afterwards discovered several other members of the Bahama chain, besides a large part of the north coast of Cuba, and the harbours on the north side of Haiti, or Española, that is, "Little Spain," as it continued to be called during the centuries of Spanish rule. But Columbus himself supposed that this island was Zipangu, that is, Japan, while Cuba was taken for a peninsula of Cathay, or China. During the voyage the admiral made his arrangements for submitting to the Great Khan of Tartary the letters of friendship and exhortation to receive the Christian faith which had been entrusted to him by Ferdinand and Isabella of Spain. Some doubts, however, may perhaps have arisen amongst his followers, for he immediately announced his arrival in "Asia" by an official document threatening all gainsayers with a heavy fine, excision of the tongue and the lash.

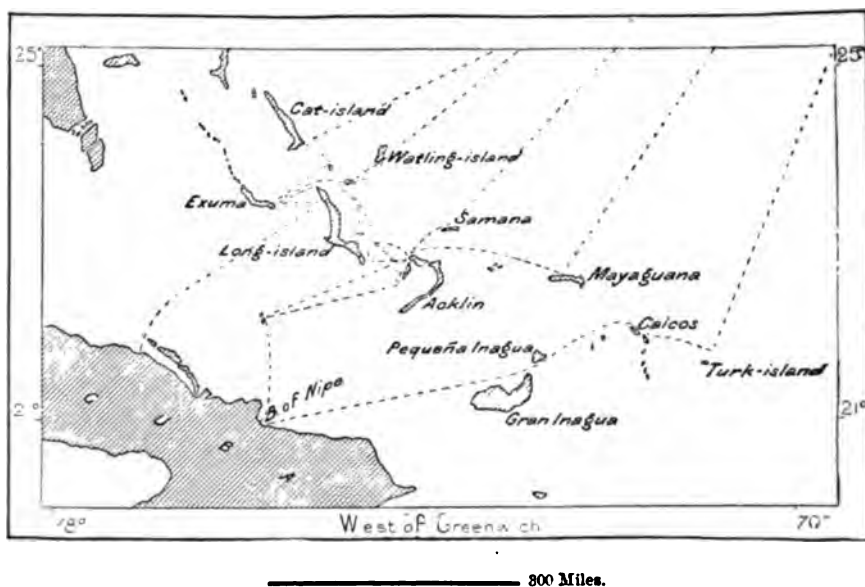
Satisfied with having reached this east coast of Asia, and with the discovery of gold and slaves in Española, Columbus made no effort to push farther towards the west. Even his second voyage the following year was limited to revisiting Cuba and Española, and surveying the coasts of Jamaica, Puerto-Rico, and the northern section of the Antilles. At last on his third voyage in 1498 he reached the main-

* H. Harrisse, *Notes on Columbus*; Ad. de Varnhagen, *La Verdadera Guanahani de Colon*; Becher, *The Landfall of Columbus*; Major, *Journal of the R. Geol. Soc.*, 1871.

land at the Orenoco delta and the peninsula of Paria. On this occasion he had sailed far to the south, acting on the advice of the Jew, Moses Jacob Ferrer, who had induced him to hope for richer treasures in gold and precious stones under a more southern latitude, "where the people have a black skin." Although rightly concluding from the great volume of its waters that the Orenoco was fed by a vast continental basin, Columbus made no delay to explore the surrounding coastlands, but hastened towards Española, attracted by the gold mines which were to yield him enough to levy "an army of 4,000 horse and 50,000 foot and deliver the Holy Sepulchre." He was at once the first European to visit the New World, and the first planter to enslave the natives and cause them to perish in his service. But he had rivals in this fatal work, and it was the jealousies of others who had also

Fig. 3.—FIRST WEST INDIAN ISLANDS DISCOVERED BY COLUMBUS.

Scale 1 : 9,000,000.



received concessions of mines and Indians that brought about revolts, intestine strife and at last the recall of Columbus ignominiously laden with chains.

Before his third voyage he had secured the monopoly of exploration for himself and his posterity,* so that all independent expeditions had been interdicted except from the port of Cadiz under burdensome conditions. This provision, however, was not enforced, and several illegal journeys would appear to have taken place to avoid paying the fiscal charges on the products of the gold mines. Even while Columbus still governed Española two vessels, under his enemy Hojeda and the two famous pilots, Juan de la Cosa and Amerigo Vespucci, touched secretly at the island, and resumed their voyage without waiting for the governor's visit. These seafarers had also seen the mainland, coasting the seaboard for a far greater

* Herrera, *Indias Occidentales*.

distance than Columbus, from the low-lying shores of Surinam to the Cabo de la Vela, northern extremity of the Goajiros Peninsula between the coasts of Venezuela and New Grenada.

In the same year, 1499, a part of the Cumana country had already been surveyed by Peralonso Niño and Guerra; in 1500 Bastidas de Sevilla completed a first exploration of all the southern shores of the Caribbean Sea as far as the Gulf of Uraba, while Vincente Pinzon coasted the east side of the continent beyond Cape St. Roque as far as the point where now stands the city of Pernambuco, and on his return traversed the "Freshwater Sea," formed at its mouth by the Amazons river. A few weeks later these waters were again visited by Diego Lepe, and in the same year, 1500, a Portuguese fleet of thirteen vessels, under Alvarez Cabral, reached the supposed island of Santa Cruz, which was in reality the mainland of Brazil, about the southern part of the present province of Bahia. Lastly, Amerigo Vespucci, piloting another Portuguese flotilla, pushed still farther southwards, surveying the whole seaboard of Brazil as far as the Gulf of Cananea in the south temperate zone. From this point he appears to have sailed south-eastwards without again sighting land, except a remote coastline about 52° south latitude. The Austral Island of New Georgia would seem to correspond best with the position indicated in the great navigator's report.

A vast stretch of seaboard some 6,000 miles in extent had thus been opened up by the European seafarers since Columbus had penetrated into the "Dragon's Mouth," and surveyed the Orenoco Delta. He had hoped to cover himself with fresh glory, and to close his career by the discovery of a passage leading to the Indies properly so called; he had even provided himself with an Arab interpreter, and when he struck the Honduras coast he supposed he had reached Ptolemy's Golden Chersonesus, that is, the southern peninsula of Indo-China. He failed, however, to turn its southern extremity, the isthmus in question forming continuous land with the continental seaboard. But in the neighbourhood of the Chiriqui Islands, where the land is already contracted to a very narrow width, he heard of another ocean lying a little farther south, and forthwith concluded that here he was within "ten days' voyage of the Ganges." Nevertheless, he vainly sought the looked-for outlet, and had to retrace his steps after rounding Cape San Blas, close to the spot where hopes are now entertained of excavating the channel which he failed to discover. After a futile attempt to found a station to work the gold mines on the coast of Veragua he set sail for Europe, dying in 1506, two years after his return.

PROGRESS OF DISCOVERY ALONG THE EASTERN SEABOARD.

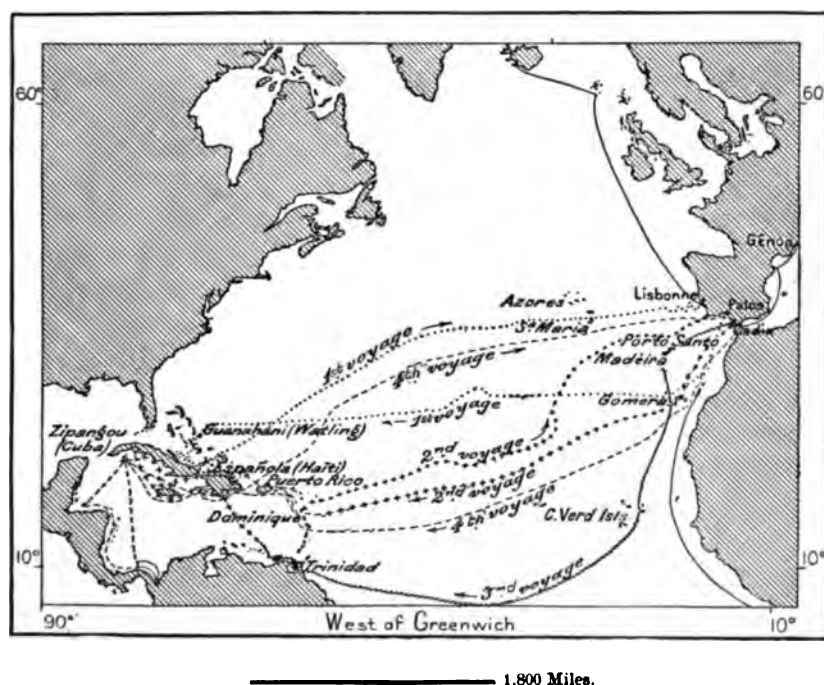
The exploration of the east coast of North America had begun before that of the southern continent had been revealed by Columbus. In 1494, Gaboto, or Cabot, another Genoese navigator, had rediscovered the shores already visited by the Norsemen. After becoming a Venetian citizen, Cabot, one of the best pilots of the age, had removed with his whole family to Bristol. Although his name is not actually mentioned it is sufficiently indicated by the expression, "the most skilful

mariner at that time in all England," who, in 1480, sailed from Bristol in search of the "island of Brazil," and who returned, two months later, to an Irish seaport after having found the island in question. At least d'Avezac thinks it probable that the pilot so described was Cabot himself.

In 1491, and again in 1492 and 1493, he made fresh expeditions to the western seas, and at last, in June, 1494, he discovered a "Land first sighted," and another neighbouring land, as is expressly indicated on a chart prepared fifty years later by his son, Sebastian Cabot. This "Prima Vista" was at first supposed to be the headland of Bona Vista on the north side of Trinity Bay, south-east coast of Newfoundland. But, according to Sebastian's chart, the north-east point of the island of

Fig. 4.—VOYAGES OF COLUMBUS.

Scale 1 : 90,000,000.



1,800 Miles.

Cape Breton was the first land sighted, the navigators passing thence between the present mainland of Nova Scotia and Prince Edward's Island.*

Resuming the "Newfoundland navigations" in 1497 Cabot coasted the mainland for about 300 leagues, planting on the headlands at intervals a large cross with the English and Venetian flags. Next year Sebastian Cabot set sail alone and followed the coast northwards to 56° or 58° north latitude, that is, to North Labrador, thence returning southwards to the shores of the present Virginia, perhaps even to those of Florida. Thus, before the close of the fifteenth century the North American seaboard was known in its salient features for a space of over

* Halton and Harvey, *Newfoundland*.

1,200 miles. English mariners continued to visit the same coastlands, and references occur to voyages accomplished by them in the years 1501 and 1504.*

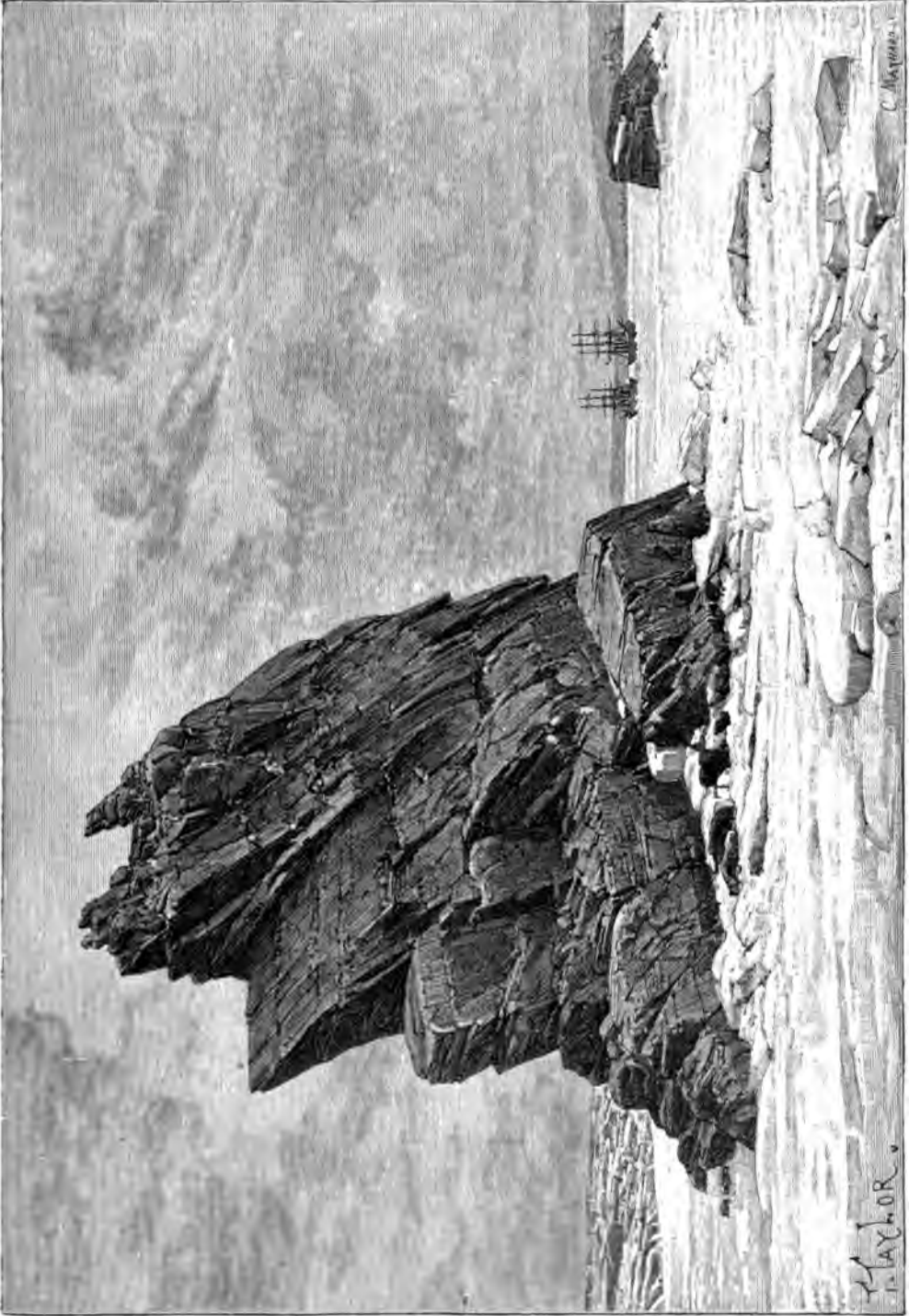
On their part the Portuguese, long in possession of the Azores in the centre of the Atlantic, naturally sought to share in the work of discovery in this part of the New World. In 1464 João Vaz Cortereal, Governor of Terceira, had already visited a *Terra do Bacalhao*, that is, "Land of the Cod," either Iceland or Newfoundland. In 1500 his son, Gaspar, also set sail from Terceira towards the northern waters, where he claimed to have discovered a "Green Land." But this very name, applied to such an inhospitable region as the present Greenland, is sufficient proof that the old Norse navigators had not yet been entirely forgotten, and even still served to direct the later seafarers on their voyages of discovery. The following year Gaspar Cortereal reached Newfoundland, traversed its rich fishing-grounds, and pushed northwards along the Labrador coast till arrested by the increasing numbers of icebergs.

Certain authorities have argued that the Portuguese navigator had endeavoured to penetrate into the northern channels for the purpose of discovering the "North-West Passage" round North America. But this view is far from probable, as at that time all those coastlands were still described as belonging to "Tartary." These northern regions were by the Portuguese collectively named the country "Dos Cortereals," in honour of Gaspar and his brother Miguel, both of whom perished in the American waters. But to the mariners, who began to be attracted in large numbers by the abundant fisheries, they were more commonly known as the Terra de Bacalhaos, "Land of the Cod."

Either about that time, or at some previous epoch, the Breton or Basque fishers gave its present name to the island of Cape Breton, possibly suggested by the province of Brittany, but more probably by the town, which at that time stood on the mouth of the Adour. Tradition, unsupported, however, by any extant documents, is unanimous in attributing to the famous Basque whalers of Saint Sebastian, Pasages, Zarauz, Ciboure, Saint-Jean de Luz, and Cape Breton, the discovery of those remote lands of the cod. The name is even mentioned of one Juan de Echaide, a Navarrese, who would appear to have penetrated farther than any other European navigator in the north-eastern waters. Nevertheless, the Basque word *bacallau* ("cod") is really of Dutch origin, already occurring under the form of *kabeljau* in the language of the northern seafarers in the thirteenth century. During the same period the French were also trading with the coast of Brazil, and in 1504 de Gonneville reached the Bay of Santa Catharina, coasting thence northwards in the direction of Bahia. Vessels from Dieppe, St. Malo, and other French seaports also frequented the same waters about that time.

Thus, in this year 1504, when Columbus left the New World for the last time, the eastern seaboard of both continents was known to a very large extent, while the West Indian waters, the first to be discovered, were explored only in their southern parts. For a quarter of a century after the discovery of the Bahamas by Colum-

* Biddle, *A Memoir on Sebastian*.



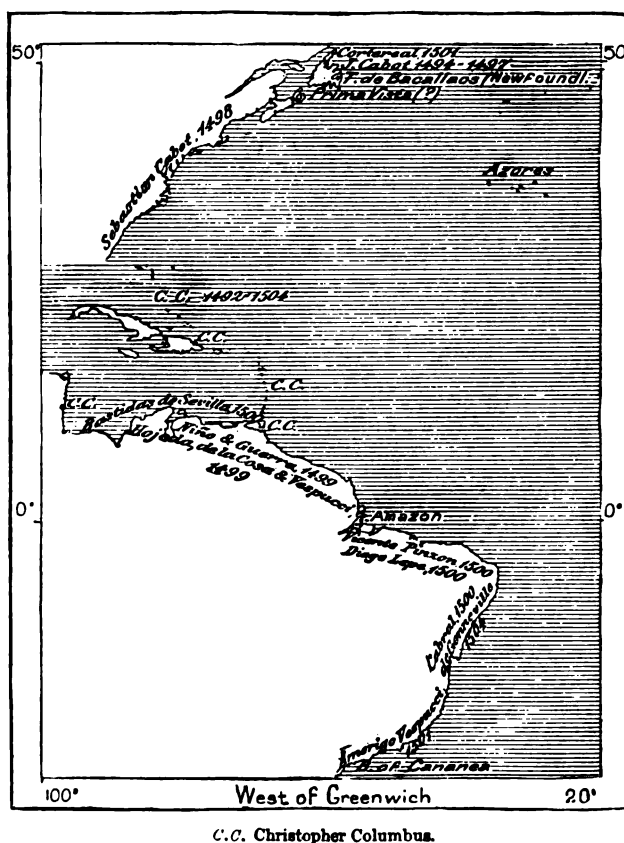
SALVAGE ROCK NEAR HARBOUR GRACE, NEWFOUNDLAND.



bus, no Spanish vessel had penetrated into the Gulf of Mexico except during the circumnavigation of Cuba. This neglect was due to the fact that the Spaniards were not concerned with any systematic exploration of the shores of the New World so much as with the discovery of seas abounding in pearls, or of lands rich in gold and slaves. In 1508 Vicente Pinzon skirted the Honduras coast as far as Belize, and five years later Ponce de Leon, with his pilot, Alaminos, approaching the Gulf from another direction, west of the Bahamas, discovered the peninsula of Florida, which they coasted northwards to Saint-Augustine Bay, and again southwards to Cape Florida and the chain of the Cayos (Keys or "Reefs"). The object

Fig. 5.—AMERICAN SEABOARD DISCOVERED DURING THE LIFETIME OF COLUMBUS.

Scale 1 : 90,000,000.



of this expedition was no longer gold, but that marvellous "fountain of rejuvenescence," which restores strength and beauty to old age.

The astounding discoveries made during recent years had, as it were, intoxicated the men of that period, to whom everything now seemed possible, and who began to fancy that the myths of their childhood had already been half realized. Columbus, navigating the brackish waters of the Orenoco estuary, claimed to have seen the river that descends from the "earthly Paradise." In the same way Ponce de Leon went in quest of the water that gives youth and everlasting health. But in none

of the islands, not even in Bimini, said to contain the sacred spring itself, did he find aught but limestone or brackish waters. Nor were those expeditions more fortunate which were afterwards conducted by Pamphilo de Narvaez, Fernando de Soto, and Moscoso in search of gold and silver store. Alvar Nuñez, however, one of Narvaez's followers, nicknamed Cabeza de Vaca ("cow-head"), reached Culiacan in Mexico, after a residence of eight years amongst the savages.

DISCOVERY OF THE PACIFIC.

The same year that saw the discovery of the coasts of Florida by the Spaniards witnessed an event of supreme importance in the history of geography. Nuñez de Balboa, who, like Columbus, had long been familiar with reports of the neighbouring ocean, at last crossed the Isthmus of Darien, and from the brow of a hill beheld at his feet the Gulf of San Miguel and the boundless expanse of the Pacific waters. In an ecstasy of joy he rushed down to the shore, waded into the water up to his middle, and armed with buckler and sword, took possession of the great sea in the name of the King of Spain. But two years elapsed before the foundation of the first European settlement on the shores of the Pacific, near the pearl fisheries of Panama, and in 1517 Espinosa launched the first vessel on its blue waters, navigating them from the Isle of Pearls to Nicoya Bay. The name of "South Sea," given by Balboa to the Pacific, and still current amongst seafarers, was due to the position of the Isthmus of Darien, running in the direction from west to east. Thus, for Balboa, the Caribbean was the "North Sea," while the inlets discovered by him on the opposite side belonged to the "South Sea." Protracted efforts were made to find the passage supposed to connect the two oceans, and in 1523 Charles V. again instructed Cortez diligently to search for this channel which had escaped the attention of Columbus.

During a slave-hunting expedition to the coast of Honduras in 1517, the slave-dealer, Hernandez de Cordova, discovered the north side of Yucatan, where he came upon the first civilized populations found in the New World. Next year Juan de Grijalva, guided by Alaminos, the best pilot of the age, pushed farther to the west and north, coasting the Mexican seaboard as far as the river Jatalpa. The fame of the treasures of Mexico was immediately spread throughout the Spanish Antilles, attracting seafarers and conquerors from all quarters. Montezuma was soon replaced by Cortez as ruler of the empire, and the explorations, hitherto mainly confined to the coastlands, began to spread their network throughout the interior of the continent. The outlines of the Anahuac plateau were soon clearly traced between the regular curve of the Gulf of Mexico and the straight coastline of the seaboard watered by the Pacific.

But although the "South Sea" was known and had already been navigated by Spanish mariners, the passage leading from one ocean to the other had hitherto been sought for in vain. In 1509 Vicente Pinzon and Diaz de Solis had pushed southwards to the vast estuary of the Rio de la Plata, and perhaps even beyond that point. Six years later Diaz de Solis had been commissioned to round the

whole American continent as far as the waters discovered by Balboa; but he was killed by the natives on the banks of the Plate river itself, in which he supposed he had found the looked-for interoceanic passage, and the honour of the discovery thus fell to Magellan. Contemporary geographers justly pointed out that the South American seaboard gradually declined westwards under the Austral latitudes just as the African is deflected eastwards, thence arguing that the New World, like the old, terminated in a point, that it also had its "Cape of Good Hope." But America penetrates much farther into the Austral Seas than Africa. Hence to reach its farthest point, and to plunge into the maze of savage fjords indenting its southern extremity, needed the indomitable energy and almost superhuman will of a Magellan. The two great navigators who gave to Spain the foremost rank in the history of discoveries, were both aliens, one an Italian, the other a Portuguese, and of the two the latter accomplished the greater work, a work of geographical exploration absolutely unrivalled. Not only did Magellan discover the passage from sea to sea, but his vessel was also the first to circumnavigate the globe. He "lifted the earth from the shoulders of Atlas and set it spinning in the free ether."—(J. G. Kohl.)

Although Magellan Strait was named the "Spanish Highway," in contradistinction to the "Portuguese Highway" around Africa, the Spanish seafarers themselves scarcely made any use of this route between the two oceans. Nevertheless, a vessel, detached by a storm from Loaysa's squadron in 1526, after clearing the Strait, was driven back to the American coast, and thus reached a Mexican port near Tehuantepec. But this vessel, commanded by Guevara, never from first to last sighted the western seaboard of the southern continent. All the discoveries along this seaboard were made by the route across the Isthmus. In 1522 Andagoya coasted southwards to the river Biru, a small stream whose name does not appear on the charts, but which suddenly assumed great importance in the eyes of gold-hunters, thanks to the glowing accounts of the natives about the treasures of the south. Two years later was founded the famous "Company of the Biru," or "Peru," between Pizarro, Almagro, and Hernando de Luque, an association which undoubtedly resulted in the acquisition of vast treasures, but which also brought about the extermination of whole populations, and the thralldom of all those that the fire and sword had spared.

The limits of the explored regions coincided with those of the reduced lands, and the Spaniards never crossed the river Maule in the southern part of Chili. Here, at the very gate of the Araucanian territory, Gomez de Alvarado, one of Almagro's lieutenants, was arrested, and beyond this point no explorer has yet succeeded in making his way overland to Magellan Strait. The coastlands have been surveyed only from the sea, the first time in 1540 by Alonzo de Camargo, who sailed from Seville through the Strait directly to Callao. In 1579 the same route was traversed in the opposite direction by Sarmiento. But to Cook was reserved the distinction of making the first complete circumnavigation of the globe by a course contrary to that followed by his great Portuguese predecessor.

The extreme point of the New World south of the Fuegian Archipelago may

possibly have been sighted in 1526 by one of Loaysa's companions. Other mariners, such as Drake and Sarmiento, also verified the insular character of the lands skirting the south side of the strait, and in 1616, nearly a century after the time of Magellan, Cape Horn was at last doubled by the Dutchmen, Lemaire and Schouten.

A Mexican port on the North American seaboard had already been chosen by Cortez as the starting point for the flotillas of the Pacific. Nevertheless, the exploration of the coast-lands in this region made less progress than elsewhere. In 1533 Grijalva sighted the Revillagigedo Islands and the southern point of the Californian peninsula; soon after Cortez and other navigators penetrated into the Gulf of California, or "Vermilion Sea," and in 1542 Cabrillo reached as far north as Cape Mendocino, beyond 40° north latitude. This is usually supposed to have been exceeded during the same century by only one other voyage, that of Drake, who struck land some 3° farther north, and thence coasted the Californian seaboard in a southerly direction. But another long-doubted maritime expedition appears to have also taken place, although no mention is made of it in the annals of Castile.* The details, in fact, given by the navigator himself scarcely leave any room for doubt on the subject. This seafarer, the Greek, Apostolos Valerianos, who claimed to have served on board a Spanish flotilla under the name of Juan de Fuca, states that a wide breach occurs on the seaboard "between 47° and 48° north latitude,"† where a strait, sheltered by a large island, communicates with marine passages opening in various directions, north-west, north-east, east, and south-east.

This fjord really exists, although it is not, as supposed by Juan de Fuca, the "Gate of Anian," affording a passage round the north part of the American continent. By a strange coincidence this term Anian, perhaps the same that had been used by Marco Polo to indicate the Indo-Chinese kingdom of Annam, had been transferred by ignorant commentators to a marine passage supposed to skirt the north side of America. In the same way Zipangu came to be applied at once both to Japan and Cuba.

THE NORTH-WEST PASSAGE.

On a map published in 1542 by Sebastian Munster, the legend "Here is the route of the Moluccas" designates either a strait in the north-east of America or else a river such as might answer to the St. Lawrence. Navigators have taken three centuries and a half to discover this "North-west Passage;" nor has anyone yet succeeded in completely circumnavigating the double continent of America. The discovery has, in fact, been made piecemeal by fragmentary expeditions. Sebastian Cabot, who was himself perhaps preceded by the Cortereals,‡ advanced in the direction of the Arctic Seas in the hope of finding the famous China

* *Relacion del Viaje hecho por las Goletas, Sutil y Mejicana*, 1792.

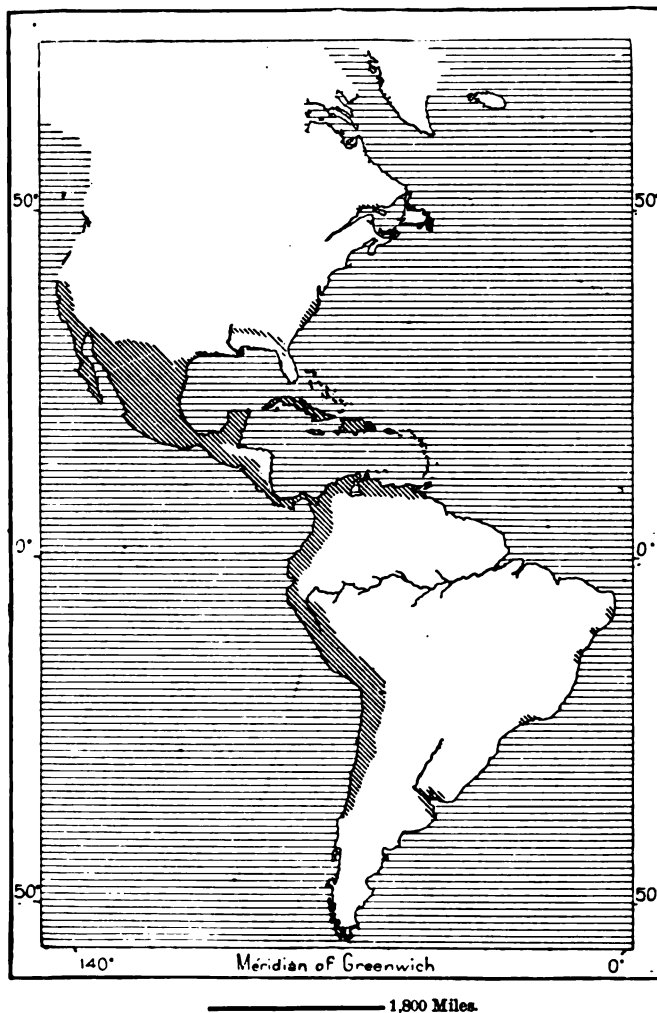
† The entry to the Juan de Fuca Strait really lies some 30 miles farther south.

‡ Burney: *Voyages in the South Sea*.

passage. He reached $67^{\circ} 30'$ north latitude, and meeting open waters to the north-west, firmly believed in the possibility of sailing right through to China by this polar route, which would have been three times shorter than that of a Panama Strait. But he was compelled by the faintheartedness of his companion, Sir Thomas Pert, to give up the attempt, and it remains doubtful whether the route followed was that of Hudson or Davis Strait. According to Biddle and the

Fig. 6.—PART OF AMERICA KNOWN AT THE CLOSE OF THE SIXTEENTH CENTURY.

Scale 1 : 120,000,000.



indications recorded in the chart of Ortelius, the two navigators took the Hudson passage, which was thus discovered long before the voyages of Frobisher and Hudson.

Over fifty years elapsed before Sebastian's track was again followed, nor did his successors at first reach such high latitudes. Estevan Gomez, a deserter from Magellan's expedition, appears to have got no farther than the Bay of Fundy, the

name of which, despite its present English form, is none the less of Spanish origin. Verrazano, a Florentine, who visited the shores of the New World by order of Francis I., made no important discovery beyond the entrance to the Hudson, while doubt has been thrown on the voyage said to have been undertaken by the Portuguese Alvarez to the St. Lawrence river in 1521. Jacques Cartier appears to have been the first to recognise in 1535 the fluvial character of the waters which prolong the estuary opening west of Newfoundland and of the insular groups at its entrance. The great value of Cartier's expedition in the history of geographical progress is due to the fact that it forms the starting-point of the voyages of discovery in the interior of the continent as far as the Mississippi Delta, the Rocky Mountains, and the Frozen Ocean.

Contemporary geographers fancied there must be some sort of balance in the form of the various continental masses. As they believed in the existence of an Austral world corresponding in the Oceanic regions to the lands of the Northern Hemisphere, they also supposed that to Magellan Strait, at the southern extremity of the New World, there must correspond another in the northern continent; in fact, that "Gate of Anian," which Juan de Fuca pretended to have traversed all the way to the Atlantic. Nay, more, to them it seemed that the attenuated form of South America must be reproduced in the north; hence the hope of discovering towards the extremity of Labrador a short passage leading directly from ocean to ocean. English navigators claimed an almost exclusive monopoly of exploration in these northern waters. The "Portuguese" route by the Cape of Good Hope as well as the "Spanish" by Magellan Strait being closed to them, they naturally sought to strike out a "British" highway in the far north. In this spirit, Willoughby and Chancellor attempted the "North-east" Passage with the view of reaching China by coasting round the north of Russia. In the same way, Frobisher endeavoured in 1576 to force the "North-west" Passage by following the course indicated by Sebastian Cabot. After penetrating far into a channel flowing, as he supposed, between America and Asia, this daring pioneer returned to announce the news in England. But in two subsequent voyages he failed to get beyond the *Meta Incognita*, or "Unknown Limit," that is, the peninsula of Kinguaik, by which his western horizon had been closed in. Then Frobisher was diverted by the quest of gold from more speculative enterprises. Having discovered certain black stones supposed to be very rich in ores, but from which the chemists vainly attempted to extract the precious metal, he sailed in 1578 with a fleet of fifteen vessels, for the purpose of shipping cargoes of these useless blocks, and erecting forts to guard the mines from foreign nations. But so uncertain was the position of the region discovered by him that it was long sought in the eastern parts of Greenland; nor have modern metallurgists yet succeeded in identifying those black stones which gave rise to so many costly expeditions.

In 1585, Davis * resumed the work of exploration, penetrating far into the broad channel which stretches east of the polar archipelago, and which now rightly bears his name. He also discovered in the western lands a winding fjord,

* See life of this illustrious navigator by Clements R. Markham, 1889.

the Northumberland Inlet, another of those passages which it was hoped might communicate with the China waters; but after surveying this opening in 1587, he found the Atlantic here also barred by impassable rocks and islands. The famous pilot, Hudson, then in the service of England, hoped to be more successful in 1610, when, after coasting the whole of the Labrador peninsula, he perceived between two islands the open sea stretching away to the south and south-west. Under the impression that this must surely be the Pacific, he sailed exultingly southwards, but his career came to a sudden end before he could be undeceived. Overpowered by his mutinous crew, he was placed with some companions in a small boat, and left, almost without provisions, to perish no one knows where. In death he may at least have had the consolation of fancying that he had solved the great geographical problem.

Other navigators penetrated after him into the inland sea which now bears the name of Hudson Bay. But it was soon found that this vast basin was closed on all sides, except towards the north and north-east, and the pilot Baffin at last announced in 1616 that all hope must be given up of reaching the China seas by this route, and that the passage must be sought farther north. Accordingly, under the orders of Bylot, he pushed towards the Pole through Davis Strait to its north-west prolongation, the present Baffin Bay, reaching as high as $77^{\circ} 30'$ north latitude in Smith Sound, which for two hundred and fifty years from that time remained unvisited by any navigator. Towards the west, Baffin observed two broad openings—Jones Sound, obstructed with ice, and Lancaster Sound, into which he cautiously penetrated. On his return to England, his verdict was, "There is no North-West Passage."

This verdict was accepted as final, and all farther research in that direction was almost entirely abandoned. The Hudson Bay Company also, which was founded in 1669, and to which Charles II. granted vast privileges, possessions, and exclusive trade rights, jealously guarded its monopoly of that region. A few London merchants thus became masters, not only of the coastlands round the land-locked basin, but of the whole of Arctic America, warding off all rivals who might encroach upon their trade in peltries. All exploration of the seaboard was forbidden; all non-authorised discoveries were buried in secret archives; false reports on the difficulties of the navigation were spread abroad, all with a view of securing to the directors the undisturbed enjoyment of their commercial privileges. To the posthumous influence of the now extinct Company have even been partly attributed the prejudices which have hitherto prevented the settlement of the coastlands round the southern shores of Hudson Bay.

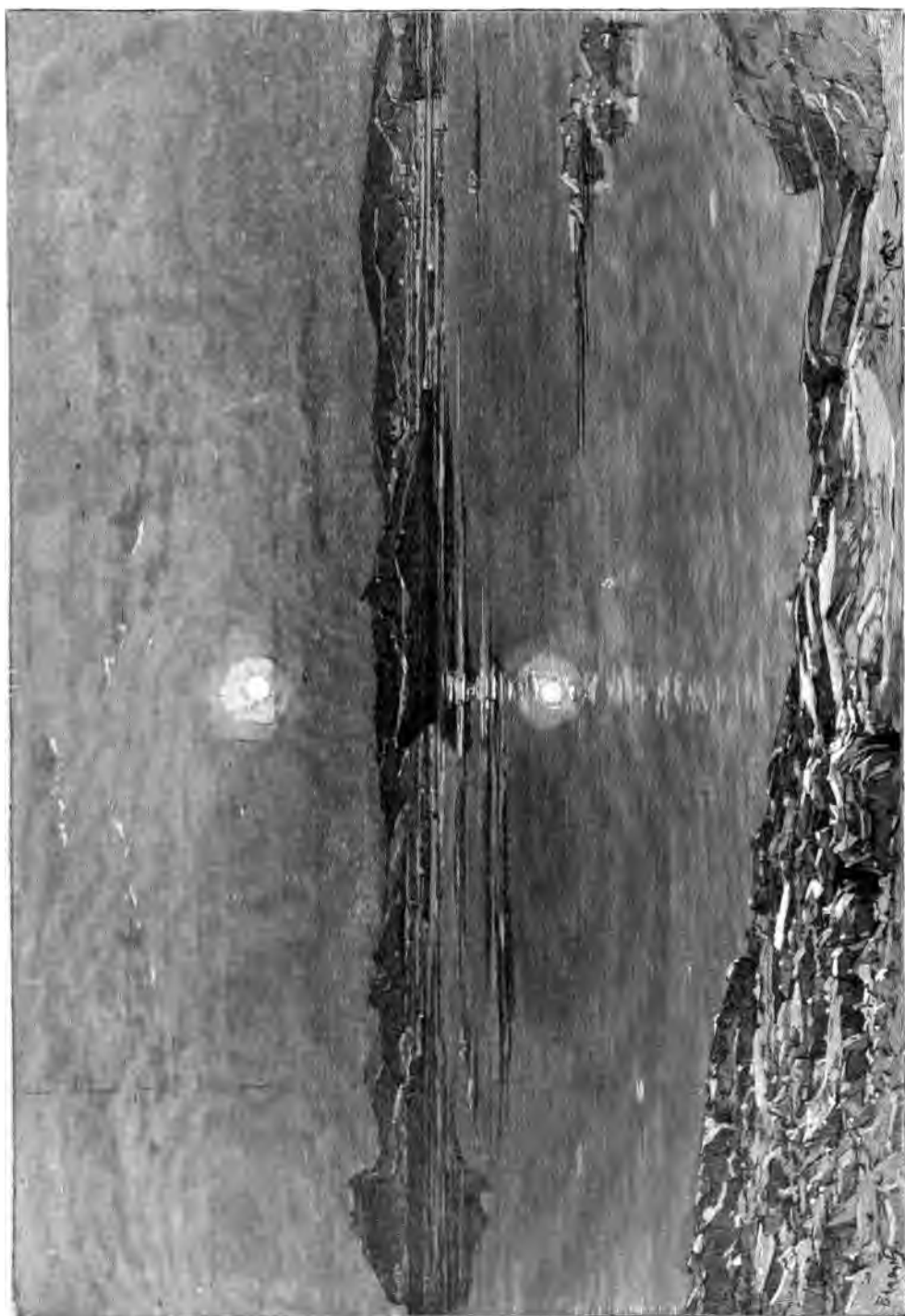
But while all progress was suspended throughout the eighteenth century in the north-east, the north-western parts of the continent continued to emerge from the obscurity from which the great epoch of Spanish enterprise had failed to rescue them. The Russians now made their appearance in this field, ushering in their operations with the all-important discovery of the strait separating the two worlds. Henceforth America could no longer be regarded as a geographical dependency of China or "Tartary." In 1725 Bering rounded the extreme eastern headland

of Asia, passing through the strait which now bears his name; he failed, however, to descry the opposite or American side of the strait, which was seen from a distance by Gvozd'ev five years later. This eastern land had already long been reported by the Chukches to the Russian Cossacks, who called it by anticipation *Bolshaia Zeml'a*, or the "Great Land." Its existence was, however, abundantly attested by the driftwood, the sculptured blocks, the cetaceans bearing embedded in their flesh harpoons of strange form, and the Cossacks themselves had met natives of that remote region in the Chukche camping-grounds.

In 1741 Bering and Tchirikov struck the American coast near the point dominated by Mount St. Elias, thence coasting westwards, and so discovering the southern part of Alaska and the Aleutian Archipelago. After the death of Bering on the island now known by his name, other daring seafarers, fishers, hunters, and traders continued the work of exploration on the "Great Land." But the real form of the coastline was first revealed in 1778 by Cook, who penetrated into the Bering Sea through an opening in the Aleutian chain, sailing from headland to headland across the strait properly so called, and coasting the American side north-eastwards. Here his attempt to force the ice and thus reach England by the direct north-east passage was frustrated by a continuous mass of pack-ice at Icy Cape. The farthest point reached by Cook in these waters was not exceeded till the present century; his immediate successors, Lapérouse and Vancouver, surveyed that part only of the seaboard which lies south of Alaska.

No further attempt was made till after the wars of the Empire to force the polar ice in search of the north-west passage. But now the effort was renewed with a far nobler purpose than that by which the early explorers were animated. The English, who had undertaken this mission as a sort of national duty, no longer aimed at collecting auriferous shingle, or even at discovering some shorter trade route between west Europe and China. Their object was rather to complete the geographic survey of the northern hemisphere, to observe all the phenomena of polar life, to study the populations scattered over those snowy or storm-tossed regions—in general, to increase the sum of human knowledge. For the purposes of this great undertaking, needing all the highest qualities of courage, steadfastness, and devotion, appeal could be made only to the best wherever to be found. Nevertheless the work was begun by an act of injustice, the Government rejecting Scoresby because he had the misfortune not to belong to the Royal Navy, although his previous career, as well as public opinion, pointed to him as the Arctic explorer in a pre-eminent sense.

But despite this mistake the history of the "North-West" navigations abundantly attests the rare skill and daring of the men employed in these missions, both as seafarers and scientific explorers. In volunteering to take part in such enterprises they resigned themselves beforehand either to the slow corruption of scurvy, or to a living tomb in some Arctic snowstorm, or else to being crushed between two blocks of ice. In any case they could not hope to escape passing many dreary winters far from their homes, without the possibility of communicating with their friends, constantly exposed to a lingering death by cold and hunger



VIEW TAKEN IN MELVILLE BAY.



in some ice-pent prison under the impenetrable gloom of an interminable Arctic night. Yet these men were found in thousands, eager to share in the numerous polar expeditions that now followed in rapid succession, and the records of those expeditions show that with scarcely an exception those dauntless seafarers stood loyally to their post amid the most formidable trials. In the history of humanity, so full of dark deeds of shame and outrage, the record of the British explorations in the polar regions of the New World is probably the brightest picture yet unfolded of human nature. The nineteenth century may proudly bequeath this example of sustained heroism to future ages.

In 1818 John Ross resumed the work of research at Lancaster Sound, at the very spot where it had been abandoned by Baffin two hundred years before. But, like Baffin, he also concluded that this channel, as well as all the other inlets in the same waters, was an inland basin enclosed by mountains. To his companion, Parry, fell the honour next year of piercing the zone of clouds and fog which Ross had mistaken for a rocky barrier. He thus penetrated into Barrow Strait between two of the large islands which have since been named the Parry Archipelago. He even traversed more than half the distance separating the outlets of the Frozen Ocean; but, being blocked by ice south of Melville Island, he was compelled to winter for nine months in Melville Sound, returning to England the next year after vainly casting about for an open passage to the west, and without meeting the explorers, Franklin, Hood, and Richardson, who had been sent to his aid overland round the shores of the Arctic Ocean.

In 1821 Parry renewed the attempt by another route, that of the channels opening to the north of Hudson Bay. Thanks to the reports of the Eskimo, illustrated by a chart prepared by a woman of the local tribe, he was able to utilise a long winter's captivity in surveying by land the narrow Fury and Hecla Strait, which communicates with the labyrinth of winding waters in the Polar Archipelago. Lastly, in another expedition, he penetrated into the Regent Inlet, a southern branch of Lancaster Sound, thus preparing the way for his old leader, John Ross, who spent no less than four winters in these frozen seas. Ross escaped through Lancaster Sound in two boats, made of a spar from one of Parry's vessels. But, persisting in the idea that the North-West Passage had no existence, he ventured to assert that the peninsula of Boothia Felix connected America with the North Pole. He even declared before a Committee of Inquiry that he had determined a difference of "thirteen feet" between the level of the eastern and western seas, a difference which he had foreseen from the rotatory movement of the earth. The honour of the expedition fell chiefly to the commander's nephew, James Clark Ross, who discovered, on the west side of the Boothia Felix Peninsula, the spot where, on July 2nd, 1831, the magnetic needle pointed almost vertically to the ground, thus indicating the magnetic pole as at that date.

After two land journeys across the solitudes of New Britain and along the Arctic shores Franklin was, in his turn, entrusted with a marine expedition, sailing in 1845 for the Polar Archipelago. He failed, however, to return at the expected time, two years later, and the British public, alarmed for the safety of

this universally esteemed navigator, compelled the Government to despatch other expeditions by land and sea to his rescue. The American, Grinnell, also equipped two vessels for the same purpose, and in ten years as many as thirty-five ships, manned by over one thousand hands, scoured all the waters of the Archipelago, studying its fjords and channels, erecting signals on the headlands, depositing "caches" of supplies in the most favourable places, promising rewards to the Eskimo for the least scrap of information. The very birds, wolves, and foxes were captured and again let loose, charged with messages for those who might happen to ensnare or shoot them. In August, 1850, no less than ten research vessels were assembled off Beachy Island, at the entrance of Wellington Strait, a larger fleet than ever before or since appeared in those waters. The remains of the last camping-ground of the Franklin expedition were at length discovered not far from the Great Fish Lake on the mainland, and in 1859 MacClintock found a written document describing the series of misfortunes that had overtaken the ships and their crews. Of the one hundred and fifty-eight men all had perished of disease and hardship.

During this period of research the problem of the North-West Passage had been solved. In 1850 MacClure, penetrating through Bering Strait into the Frozen Ocean, coasted the American seaboard beyond Icy Cape, discovered by Cook. Then rounding Barrow Point, which had arrested Beechey in 1826, he passed from headland to headland all the way to Banks' Strait, where Parry had been icebound during his first expedition. Here MacClure was himself detained for two winters; but he had fortunately crossed the frozen strait during the spring, and had thus succeeded in bearing his dispatches to a station on Melville Island, where Kellett, arriving from the eastern channels, was blocked in his turn. Communications were in this way established between the two oceans, and when MacClure was about to send half his crew southwards over the mainland, Kellett's men hastened to revive the failing spirits of the party, already brought to death's door by famine and despair. The North-West Passage had therefore been found by a "Magellan of the North," as Franz Schrader wrote in 1874; it had been proved possible to pass from sea to sea, but by exposure to such dangers that since the time of MacClure, Kellett and Collison, no other navigator has attempted to follow this route. Thus was closed in 1853 this chapter in the history of geographical discovery, though doubtless the detailed exploration of the whole region will again be resumed according as stations and places of refuge spring up along the Arctic seaboard.

EXPEDITIONS TOWARDS THE NORTH POLE.

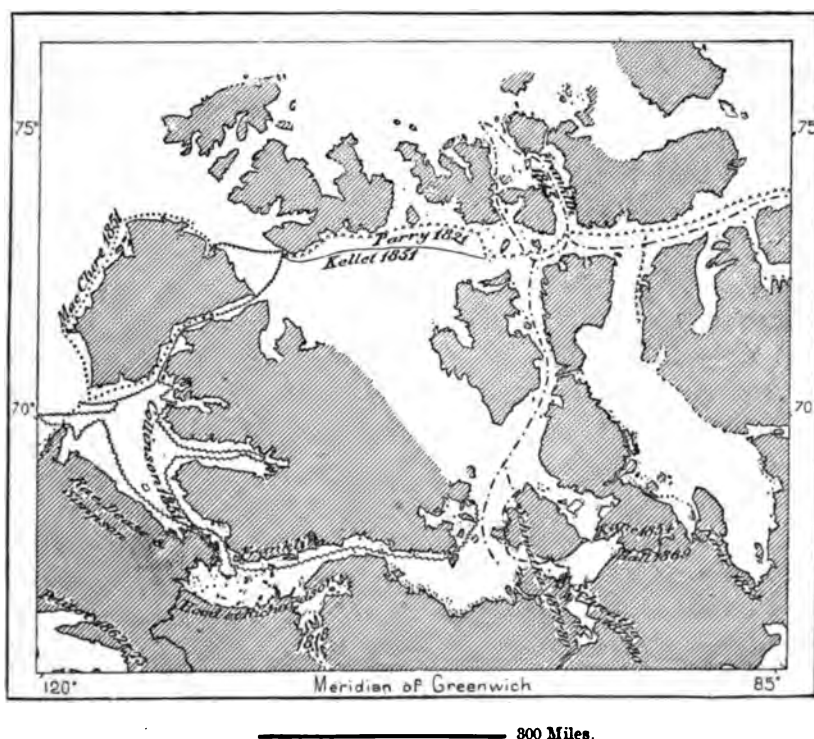
With the efforts made to force a way through the icy channels of the Polar Archipelago was naturally associated a desire to approach, or even reach, the North Pole itself. During previous centuries mariners had already pointed in that direction through openings in the pack-ice, and, according to one legend, certain Dutch sailors had even reached the goal in 1670. In any case the names are recorded of several persons, whalers for the most part, who passed beyond the

80th parallel in the North Atlantic. Thus Hudson would appear to have reached 82° before he was arrested by the icy barrier; in 1775 Phipps sailed beyond Spitzbergen and the "Seven Islands"; Scoresby pushed forward in 1806 at least some twelve miles higher than 81° , and this explorer frequently expressed the opinion* that he might easily reach the Pole by sledging, the ice by which he was arrested being perfectly continuous and so level that if swept of its snows it might be crossed by stage-coaches.

Supporting himself on the authority of these pioneers Parry induced the British Admiralty to entertain his project of reaching the Pole across the pack-ice. In

Fig. 7.—THE NORTH-WEST PASSAGE.

Scale 1 : 15,000,000.



this way he got as far as $82^{\circ} 45'$, the highest record for the following half century, and so far the absolute highest in that region of the North Atlantic. During the latter part of the expedition no progress was made by the efforts of the men to drag their boats over the ice, for although they appeared to advance northwards, the ice itself drifted southwards with the current. Hence they had to give up the attempt and to allow themselves to drift with the ice back to the starting-point.†

Hitherto the highest latitude has been gained not, as was hoped, by the open sea forming the northern prolongation of the Atlantic, but by the west side of

* Scoresby, *Account of the Arctic Regions*.

† W. E. Parry, *Narrative of an Attempt to reach the North Pole*.

Greenland through the narrow ice-obstructed channels of the Polar Archipelago. Following up the explorations of the English navigators, Penny and Inglefield, Kane, the American, was the first to try this route in 1858. North of Baffin and Melville Bays he penetrated into Smith Sound, where he had to force a passage across the hummock to reach other basins by which this marine channel is continued in the direction of the north and north-east. Few polar explorers encountered more tremendous difficulties, rugged icefields, stormy waters, disease, extreme cold, the mercury remaining frozen for four months together. Yet on his return from this terrible voyage Kane ventured to report north of the strait an easily navigable channel, completely free of ice, and beyond it the open Polar Sea. Such a report could not fail to stimulate fresh efforts in the same direction.

Hayes, who had accompanied Kane on this memorable expedition, again plunged in 1860 into the chain of straits and basins which separate Greenland from the Polar Archipelago. After surmounting in sledges the ice piled up north of Smith Sound he approached some distance nearer to the Pole; but he no longer found Kennedy Channel free of ice, as it had been during the previous voyage. Nevertheless, the ice lying farther to the north was less compact and weaker than elsewhere, and Hayes returned from his expedition still a firm believer in the hypothesis of a "free Polar sea." Hall, who followed him in 1871, and who died not far from his highest record ($82^{\circ} 16'$), visited these supposed open waters, but found that precisely here the passage was most contracted, forming the narrow and mostly ice-obstructed Robeson Channel. On the return voyage his vessel, the *Polaris*, was even crushed between the floes; but it had already been half abandoned, and it was on this occasion that nineteen persons, including an Eskimo infant two months old, drifted on some floating ice southwards to a point where they sighted a steamer near the Labrador coast. The castaways, who were furnished with some provisions and a boat, traversed over 2,000 miles during the space of six months, nearly half of which was passed in the gloom of the Polar Sea. Three years previously the crew of the German ship, the *Hansa*, had met with a similar adventure on the east coast of Greenland, along which they had drifted for eight months southwards to the station of Fredricksdal, near Cape Farewell. The annals of Polar navigation record numerous occurrences of a like kind, such as that of MacClintock, who, in 1857, was carried in 242 days a distance of 1,300 miles in a retrograde direction. About the same time a Greenlander and his wife, borne on a block of ice across the strait, were landed without accident near Cape Mercy on Baffin Land.*

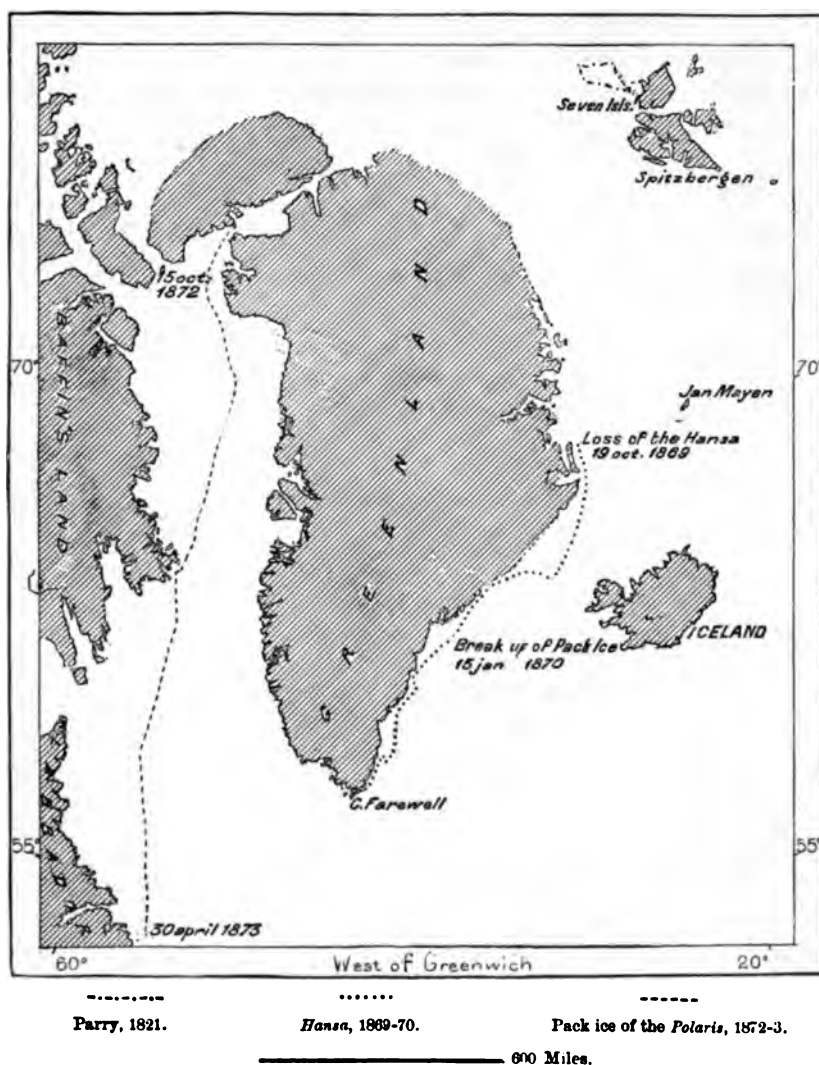
The American explorers, Kane, Hayes, and Hall were followed in 1875 by the English expedition under Nares, which also took the Smith Sound route, and which at last succeeded in penetrating through Robeson Channel into the boundless sea flowing north of Greenland and Grinnell Land. But so far from being "free," as reported by the previous navigators, this sea appeared to be covered with huge masses of ice 25 to 30 yards thick, alternately fissured by the billows

* Kümlein, *Smithsonian Miscellaneous Collections*, vol. xxiii., 1882.

and again bound together by the frost, and strewn with blocks upraised by pressure and the shifting of the centre of gravity. A sledge journey of some sixty miles northwards showed the sea everywhere bound by these icy fetters, while away to the north nothing was visible except interminable ice or snowfields. Accordingly, the "Free Sea" was renamed the "Paleocrystic," that is, "The

Fig. 8.—ROUTES OF ARCTIC NAVIGATORS.

Scale 1 : 30,000,000.



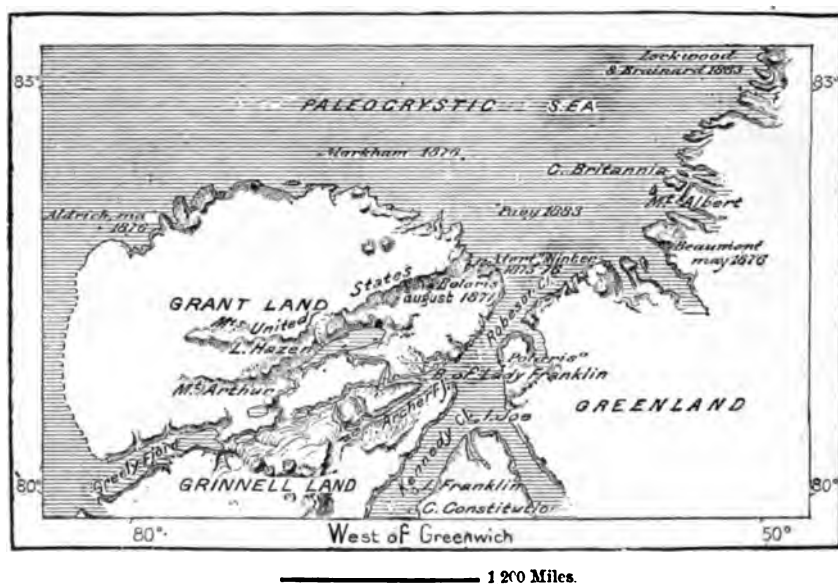
Sea of Permanent Ice." It was here that Markham, one of Nares' officers, reached $83^{\circ} 20' 26''$ north latitude, the highest hitherto recorded by any explorer. But in 1882, this record was beaten by the Americans, Lockwood and Brainard, who pushed forward to $83^{\circ} 24'$, or about 430 miles in a straight line from the North Pole. From this point they distinctly descried Cape Washington, the

northernmost land yet discovered on the globe. It lies to the north of Greenland, with which it is probably connected by intermediate ice-bound fjords.

Next followed Greely's disastrous expedition, in which two-thirds of the men perished of hunger on the pack-ice about Cape Sabine, in Smith Sound. This was the last of the great polar expeditions undertaken in our days. Since then the exploration of the American Arctic waters has been left to the Scotch and other whalers, who never venture within the narrow straits. But the work of systematic research will certainly be continued until the Arctic regions are thoroughly known to geographers. Doubtless the quest of the precise point round which are described the circles of latitude would seem a puerile undertaking did it not also involve the study of the surrounding lands and islands, the outlines of

Fig. 9.—PALEOCRYSTIC SEA.

Scale 1 : 7,000,000.



seas and inlets, the tides and currents, the movements of the atmosphere, and other phenomena of terrestrial life. On the other hand, this work itself will be more and more facilitated with the establishment of an ever-increasing number of points of observation and victualling stations in the higher latitudes, and according as the physical conditions and resources of the neighbouring regions become more fully known. The circumpolar observatories, whose original plan is mainly due to the Arctic explorer, Weyprecht, have already been partly founded at the cost of the European nations and the United States, and Greely's voyage was undertaken for the purpose of establishing one in Lady Franklin Bay, on the very margin of the Paleocrystic Sea. It should also be remembered that all the vast resources of modern industry have not yet been placed at the service of northern explorers, and that it still remains to be seen what may be accomplished

by aërial navigation. About a hundred and fifty expeditions have been equipped for the Arctic waters since the discovery of America, while thousands of whalers have penetrated into the same regions. Other voyages must follow, and one at least is already provided for through the munificence of Gustave Lambert.

At present, to complete the geographical outlines of the New World, nothing remains except a survey of the North Greenland seaboard between the waters

10. —CIRCUMPOLAR OBSERVATORIES.

Scale 1 : 80,000,000.



visited by Lockwood and the extreme points of the east coast. This space of about three hundred miles in a straight line remains, with a few gaps of less importance in the Polar Archipelago, the only blank that cartographers have still to fill up. Apart from Greenland itself, the interior of both American continents is already known in all their main features. The gradual settlement of the country by civilised white or half-caste populations has been necessarily followed,

if not by the scientific, at least by the topographic exploration of the various lands. Memorable expeditions have also distinguished the periods when the different regions successively entered the sphere of human culture.

PROGRESS OF DISCOVERY IN THE NORTHERN CONTINENT.

In the Northern Continent, the first visited by Europeans, the chief share in the work of discovery fell to the French travellers, thanks to the dominant position given to them by the colonies situated about the radiating point of the great watercourses, the St. Lawrence, the Mississippi, and the tributaries of Hudson Bay and the Arctic Ocean. Champlain, the true founder of the Canadian colony and first settler of Quebec in 1608, penetrated westwards to Lake Nipissing, and even navigated an inlet of Lake Huron, which forms part of that "sea of sweet waters" already figuring on the maps. The Catholic missionaries, full of zeal for the "conquest of souls," and the political constitution of states directly subjected to their power, or at least their influence, soon occupied the most advanced stations in the interior of the country, and through their "coureurs des bois" and Indian converts acquired a sufficient knowledge of the land to secure for themselves a considerable share of its trade.* They themselves explored the surrounding regions in all directions, and in a few years penetrated to the very heart of the continent. Guided by members of the allied tribes whose manner of life, toils, and hardships they gladly shared, these intrepid pioneers navigated all the rivers tributary to the St. Lawrence, all the lakes flooding the depressions of the Lawrentian rocks.

In 1640, Brébeuf beheld the tremendous falls of the Niagara River, and traversed Lake Erie. In 1660, Mesnard, ascending the Outaouais River, reached the shores of Lake Huron, crossed the Sault St. Mary at the issue of Lake Superior, and coasted the southern shores of that lake, the largest freshwater basin on the globe. Allouez, another missionary, pushed forward to the "Fond du Lac" at the western extremity of Lake Superior, and discovered the river St. Louis, main upper branch of the whole fluvial system of the St. Lawrence. He also surveyed the shores of Lake Michigan, and penetrated westwards to the territory of the Illinois Indians, later traversed in its entire length by Jolliet and Marquette. By following the course of the Mescousin, the present Wisconsin, these travellers reached the Mississippi in 1675, although still ignorant of its course and outflow, despite Fernando de Soto's expedition made over one hundred and thirty years previously. They also determined the confluence first of the Missouri and then of the Ohio, magnificent streams which at that time bore different names. But on approaching the river Akamsa (Arkansas), they no longer doubted that the Mississippi flowed to the Gulf of Mexico, and did not venture to proceed farther for fear of being arrested by the Spaniards as foreign explorers. However, the Spaniards themselves advancing into the interior of the "Floridas" in quest of gold, had penetrated to the point visited by

* Francis Parkman: *The Jesuits in North America*.

Marquette, and had thence drifted with the stream down to the Gulf of Mexico.

The Jesuit missionaries thus took the largest share in the discovery of the North American fluvial basins. But they saw with reluctance members of other religious orders, private traders, and even military leaders venturing to explore a region which they regarded as their exclusive domain, and the history of the seventeenth century in Canada is full of their bickerings with other missionaries and travellers. Thus by all manner of Court intrigues and obstacles of every kind they endeavoured to exclude Cavelier de la Salle from the routes leading to the Mississippi. Nevertheless, the Norman traveller, a man of remarkable intelligence, firmness, valour, ready wit, and unflagging perseverance, achieved his purpose in the end. After three expeditions to the regions lying beyond the lakes, after adventures of all kinds, wars, alliances, shipwrecks, assaults, retreats, and a serious malady caused by poisoning, he at last embarked in the spring of 1682 on the "Father of Waters," exploring it to the delta in the course of fifty days' navigation. Two years later he returned from France with a flotilla to ascend the river as viceroy of Louisiana; but the command of the vessels had been given to a personal enemy, who betrayed Cavelier, landing him almost without supplies on the present coast of Texas, and himself continuing the exploration of the Mississippi mouths. But the indomitable De la Salle, still undertaking to continue his surveys by land, was assassinated by one of his officers a few days after setting out for the great river.*

The vast regions stretching west of the Mississippi towards the Rocky Mountains and lacustrine and fluvial plateaux draining to the Frozen Ocean, were brought within the domain of geography mainly through those "coureurs des bois," mostly independent traders, against whom the Canadian authorities issue the severest edicts. But they had a boundless world before them, and when hard pressed on the frontier of the settlements they could retire to the hunting grounds of the redskins. With these they entered into the closest relations, marrying their daughters, but retaining the French language and preserving their relations with the peltry dealers. From sea to sea they opened up the routes afterwards followed by the European explorers. When the great traveller De la Vérandrye, in 1731, crossed the "Hauteur des Terres" north-west of Lake Superior and entered the region draining to the Arctic Ocean, he was escorted by these half-castes, who pointed out the watersheds of lakes and rivers, the camping-grounds, the forests abounding in game. He surveyed the shores of Lake Winnipeg, the banks of the Red River, of the Assiniboine, the Saskatchewan, the upper Missouri, and Yellowstone, and crowned these achievements by scaling the Rocky Mountains, returning to the civilised world after fourteen years of wanderings and hunting expeditions.

During the present century these "voyageurs," whites or half-breeds, have still been the guides in most of the supplementary excursions undertaken to connect the various itineraries on the eastern and Pacific slopes. Even during these land expeditions the delusions of the North-west Passage continued to fire

* Fr. Parkman: *The Discovery of the Great West.*

the imagination of many Canadian traders. In the absence of an open sea or of a chain of straits and channels between the Atlantic and Pacific, hopes were entertained of discovering navigable lakes and rivers forming a commercial highway across the continent. Nearly all the charts of the eighteenth century represent the American Arctic regions as intersected by a labyrinth of large rivers and inland seas forming a continuous waterway between the two oceans. So late as 1789 Meares endeavoured to prove the existence of a north-west passage between Hudson Bay and Bering Strait through the Winnipeg, Athabasca and Slave lakes, and by a river where occur the largest falls in the known world.

PROGRESS OF DISCOVERY IN THE SOUTHERN CONTINENT.

In South America the exploration of the interior, which followed the conquest of the outer plateaux and coastlands, was prosecuted, as in the north, by traders and missionaries. But on the eastern slopes of the equatorial Andes the sudden contrast of climate and soil between the uplands and plains, the impenetrable forests, the great watercourses, insalubrious marshlands and justly hostile populations long retarded the progress of research in the lower regions occupying the very heart of the South American continent. After Orellana's memorable journey in 1540 down the Amazons two centuries elapsed before any attempt was made by other explorers to connect their itineraries with his.

In the temperate zone, where obstacles of all kinds were much less formidable travellers soon penetrated far into the interior. The "Paulistas," that is, the Brazilians of the province of St. Paul, commonly called *mamelucos*, made numerous excursions westwards to the Parana basin either for trading purposes, or more frequently to procure slaves. The Jesuits also, protectors of the natives against the Paulistas, but with a view to their own aggrandisement, established themselves in the midst of the docile Guarani populations of Paraguay, here founding a purely theocratic state, where the whole social system was regulated to the sound of the church bells with public prayers and religious ceremonies. The territory of these missions was the chief scene of the researches of the Spanish naturalist, Felix de Azara at the close of the last century. About the same time Alexander von Humboldt and Amédée de Bonpland obtained from the Spanish Government the removal of the interdict imposed on all foreigners visiting this vast domain. They were thus enabled during the years 1799—1804 to accomplish that famous exploration in the equinoctial regions, which was so to say a new discovery of the Columbian world, and which gave such a potent impulse to the spirit of research and the study of nature.

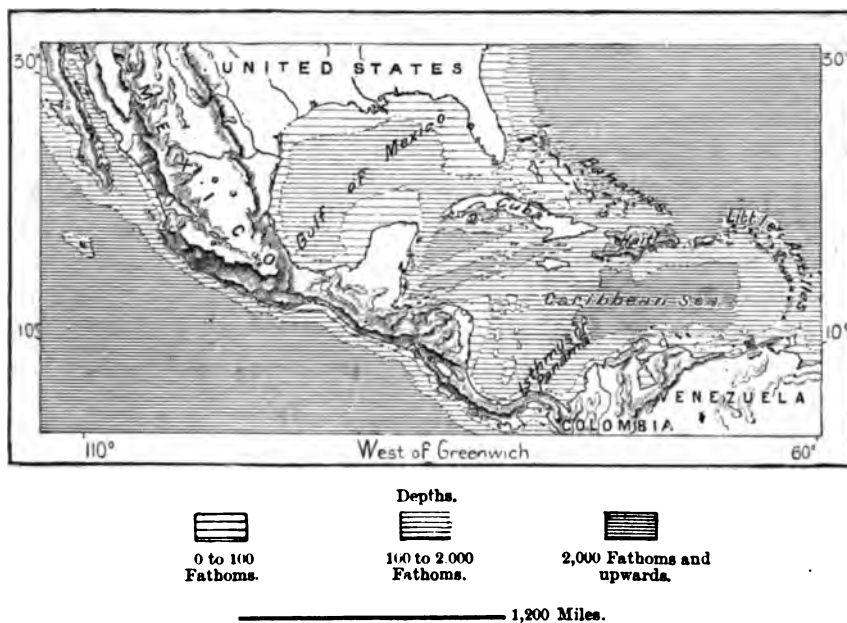
After them came Auguste de Saint-Hilaire, Spix and Martius, d'Orbigny, Darwin, de Castelnau and de Saint-Cricq, Markham, Orton, Bates, Master, Reiss and Stübel, Crevaux, Thouar, Chaffanjon and others in hundreds, who traversed the land in all directions, visited the sources of the streams and determined the exact disposition of the mountain ranges.

Compared to the work already accomplished little now remains to be done in

order completely to determine the relief of both Continents in their more salient features. The mountains and rivers of Labrador, those of the Arctic seaboard and the regions between the Mackenzie basin and Sitka Bay still present a character of great vagueness, which, however, will gradually be removed with each successive exploring expedition. In Central America, despite the relatively small extent of the space confined between the two oceans, some districts, notably the Mosquito Coast and the Talamanca territory in Costa Rica, still remain unsurveyed. Farther south the regions about the headwaters of the Orenoco and Amazons, many parts of Gran Chaco, the interior of Guiana and towards the extremity of the continent some of the eastern slopes of the Patagonian Andes offer several tracts intersected

Fig. 11.—AMERICAN ISTHMUSES.

Scale 1 : 55,000,000.



by but few itineraries. But on the other hand many of the settled regions have already been geodetically surveyed, while here and there the New World presents specimens of topographical work fully comparable to that of Western Europe.

PHYSICAL FEATURES OF THE TWIN CONTINENTS.

The New World contrasts with the Old in the simplicity of its general form and the disposition of its various parts. The binary arrangement of the continental group is far more precise than in the four eastern continents, Europe and Africa, Asia and Australia, which are also disposed in twos from north to south, but with great irregularity in their respective contours and dimensions. Considered in its relation to all the dry land of the globe, America constitutes the eastern

and far more regular section of the semi-circle sweeping round the Pacific basin. Compared with it the western section, comprising China, India and Africa, appears disjointed and broken, and is moreover decomposed into the chain of lands running from Indo-China in the direction of Australia. The axis of the American division also coincides with its main ranges all the way from Alaska to Tierra del Fuego, whereas the irregularity of outlines in the Old World makes it almost impossible to recognise its main axis, which in fact is twofold, running north-east and south-west for the water parting, east and west for the zone of culture and the march of civilisation.

Both being of triangular form and connected together by a narrow isthmus the two divisions of the New World seem at first sight to present a common limit of a very definite character. Nevertheless the passage from one to the other is so gradual and effected by so many transitions that it is impossible anywhere to say: Here ends North, here begins South America. As with the divisions of the Old World, it is extremely difficult to trace the natural frontier between the two sections, so that any parting line that may be chosen must be in a great measure purely conventional.

From the geological stand point, however, the isthmus of Tehuantepec might be taken as a natural parting line between the two Americas. At this point the last slopes of the Anahuac plateau merge in the plains, while no prominence is yet visible to indicate the rampart of the Guatemalteco highlands. East of this limit the land develops a sort of fork, one branch of which, Yucatan, is continued seawards by the long island of Cuba and the other Antilles, while the second branch constitutes Central America properly so called, with its successive rugosities and flooded depressions.

But of all the dividing lines the best defined is that where the isthmus of Darien is rooted in the vast mass of the southern continent west of the Atrato delta. Here the heights of the isthmus fall gradually without merging in the Andine system, both slopes communicating through a low sill, where the project was at one time entertained of excavating an interoceanic canal. If the structure of the two continents be studied, not as at present limited by the encircling oceans, but also in their submerged parts, North America will be found to project south-eastwards two nearly parallel sinuous tongues of land connecting it with the southern continent. These two connecting links are Central America and the West Indies, which are themselves transversely united by the island of Cuba, while profound marine abysses are revealed in the two inland seas which are enclosed on all sides by continents, islands, or peninsulas.

CONTRASTS AND ANALOGIES BETWEEN NORTH AND SOUTH.

A striking analogy of outline is presented by the two Americas, though not such as was conjectured by the navigators of the sixteenth century, who sought in the extreme north a strait corresponding to that of Magellan in the extreme south. Considered in their general structure both continents affect a triangular form

disposed in the same direction, their three sides respectively nearly parallel, and both connected by two parallel ridges—the isthmus, properly so called, of Central America and the chain of the Antilles. The northern is about one-eighth larger than the southern triangle; but its north-eastern section, comprising the Labrador peninsula, and nearly one-half of the Canadian Dominion, is severed from the body of the continent by a regular chain of lakes running for nearly 2,500 miles like a partly obliterated branch of the sea between Lake Ontario and the Great Bear Lake. Vast peninsular regions are thus cut off from the trunk of the northern continent, leaving a compact mass which presents a surprising resemblance to the southern division.

But, as at present constituted, of the two continents the northern is the less regular, the more diversified with gulfs, inlets, and peninsulas. In this respect it offers the same contrast to South America that Europe does to the monotonous African continent. It develops a coastline of some 26,000 miles, or about 6,000 more than the southern division. Nevertheless South America, less broad though nearly as long as Africa, offers a greater elegance of contours, while, thanks to its general structure and fluvial systems, its central parts are far more accessible from the sea. Like the North it enjoys the immense advantage of vast navigable watercourses, such as the Amazons, Orenoco, Parana, Uruguay, Magdalena, whereas the African rivers, mostly less copious, are also obstructed by cataracts at short distances above their estuaries. A remarkable degree of symmetry has been observed between these two continental regions, which form the southern terminations of the great semicircle of lands sweeping round the oceanic basin of the Indian and Pacific waters. The lofty Cordilleras of South America are disposed along the west side, whereas in Africa the mountain ranges and highlands occur chiefly in the east. The two isthmuses of Panama and Suez connecting them with the northern continents offer the same symmetrical arrangement; the chief South American and African rivers also flow to the Atlantic from opposite quarters, while the two protuberances formed by North Brazil and Senegambia confront each other on either side of the ocean.

The two triangular masses of America resemble each other not only in their outlines, but also to a great extent in their general relief, the disposition of their plateaux, mountain systems, plains, and rivers. Thus the lofty ranges of the Rocky Mountains and the Andes both run parallel with the western seaboard, both are decomposed in several places, breaking into two or three parallel or divergent ridges encircling elevated plateaux; both are pierced by volcanic apertures either quiescent or still active, while their sedimentary rocks are covered with vast expanses of lavas, tufas, or scorix. In each division the triangular form is determined by the main axis of the west and a secondary orographic system occupying a part of the east side in the Appalachian range in the north, the Terra de Mar and Brazilian chains in the south. In both cases the eastern systems run parallel with the coast, but are far less elevated than the western, from which they are separated by vast fluvial basins. Hence the very centre of both continents, where we should expect to find the loftiest uplands, is occupied by depressions, in which are

gathered the continental waters, and these waters flow for the most part either to the Atlantic or to the lateral seas. Thus it happens that the headstreams of the Mississippi are separated by no prominent divides from those of the St. Lawrence and Red River of the North, and the same absence of relief is presented in the South by the Orenoco, Amazons, and Parana systems.

The lacustrine region occupying the central part of North America was at one time undoubtedly far more extensive than at present. The Michigan peninsula was itself a large island, and the outflow oscillated from epoch to epoch between the Hudson, Mississippi, and St. Lawrence valleys. Numerous species of the Canadian lacustrine fauna present a pelagic character, and several lakes, such as Champlain and the Six Nations in New York State, present all the appearance of ancient fjords gradually cut off from the sea.* Some of the North American rivers also seem to have formerly been the deep channels of glaciers grinding their way slowly seawards. Such is the Saguenay, with its stupendous gorges scooped out to depths of 600 or 700 feet. Such is the St. Lawrence itself, which now gives access to the largest vessels for over 600 miles into the interior of the continent.

It should also be noticed that those parts of North America which have already shaken off their icy fetters are still in the lacustrine period that followed the glacial epoch. The lakes themselves have considerably diminished in size, but in several places their eccentric labyrinthine windings still occupy the greater part of the land. The streams have not yet regulated their course, as have those of the temperate zone in both hemispheres, but, like the Scandinavian and Finland rivers, still constitute irregular chains of lakes, connected together by a continuous series of rapids, falls, cataracts, "cauldrons," in every stage of development. In this respect Canada is the most remarkable region in the whole world. Even its great watercourses, still young in a geological sense, are interrupted by obstacles of a most formidable character, and some of these have been the scene of the most memorable conflicts between rival populations. Thus the possession of the Niagara and Ottawa rivers has been contended for to the bitter end, while colonisation was arrested for long years by the Saut du Carillon and other fluvial rapids held by the Iroquois confederacy.

GEOLGY OF THE NEW WORLD.

Before the geology of America was properly understood the opinion was often expressed that the "New" World was in its formation also more recent than the Old. Now we know on the contrary that in its present form North America is apparently the oldest of all the continental masses. Towards the close of the chalk age it had already assumed very nearly the same outlines that it now presents.† All the north-eastern parts east of the great lacustrine chain, together with the polar archipelagoes, consist of crystalline formations, or else of azoic or paleozoic sedi-

* Peschel, Ulrich.

† E. de Margerie, *Annuaire Géologique*, 1888.

mentary rocks of extreme antiquity. The outer escarpment of the mountains skirting Labrador and stretching away to the north and north-west is composed mainly of gneiss and other archaic rocks, which fall abruptly seawards, while the opposite slope inclines gently towards the interior. Westwards extends a vast plateau of pre-Silurian formation to which, from its bulging form, Suess has given the name of the "Canadian buckler." By erosion it has been almost entirely denuded of its upper paleozoic strata, and the whole of Hudson Bay has been excavated to a slight depth on the surface of its eastern section.

No other regions occur in the New World whose form and relief have been

Fig. 12.—CENTRAL WATERPARTING OF NORTH AMERICA.

Scale 1 : 2,000,000.



180 Miles.

maintained for such vast spaces throughout the series of geological ages. Compared with the Canadian plateau the oldest parts of South America are of recent origin. Great changes have undoubtedly taken place along the outer borders of the continental mass, and notably in the isthmuses and chains of islands connecting the two continents. Although it is no longer possible to study directly the surface of the now submerged lands, their primitive continuity is, in many places, revealed by the natural history of the insular groups. Thus the distribution of the various species of mollusks throughout the West Indies makes it evident that Central America and Mexico were formerly connected with the Bahamas through the large

islands of Cuba and Haiti. On the other hand the southern insular chains at one time belonged partly to the mainland of Venezuela, partly to that of Guiana.* In the same way the diversity of the faunas in the Caribbean Sea and the Pacific Ocean shows that for long ages the two divisions of the New World have formed continuous land. Of 1,500 species of marine shells belonging to the Caribbean waters, less than 50 reappear on the other side of the narrow isthmus of Panama, where, according to Adams, the classified mollusks already number 1,350 species. From this it is inferred that at least since the close of the miocene epoch there has been no communication between the two oceans, even if the separating line does not date back to far more remote ages.

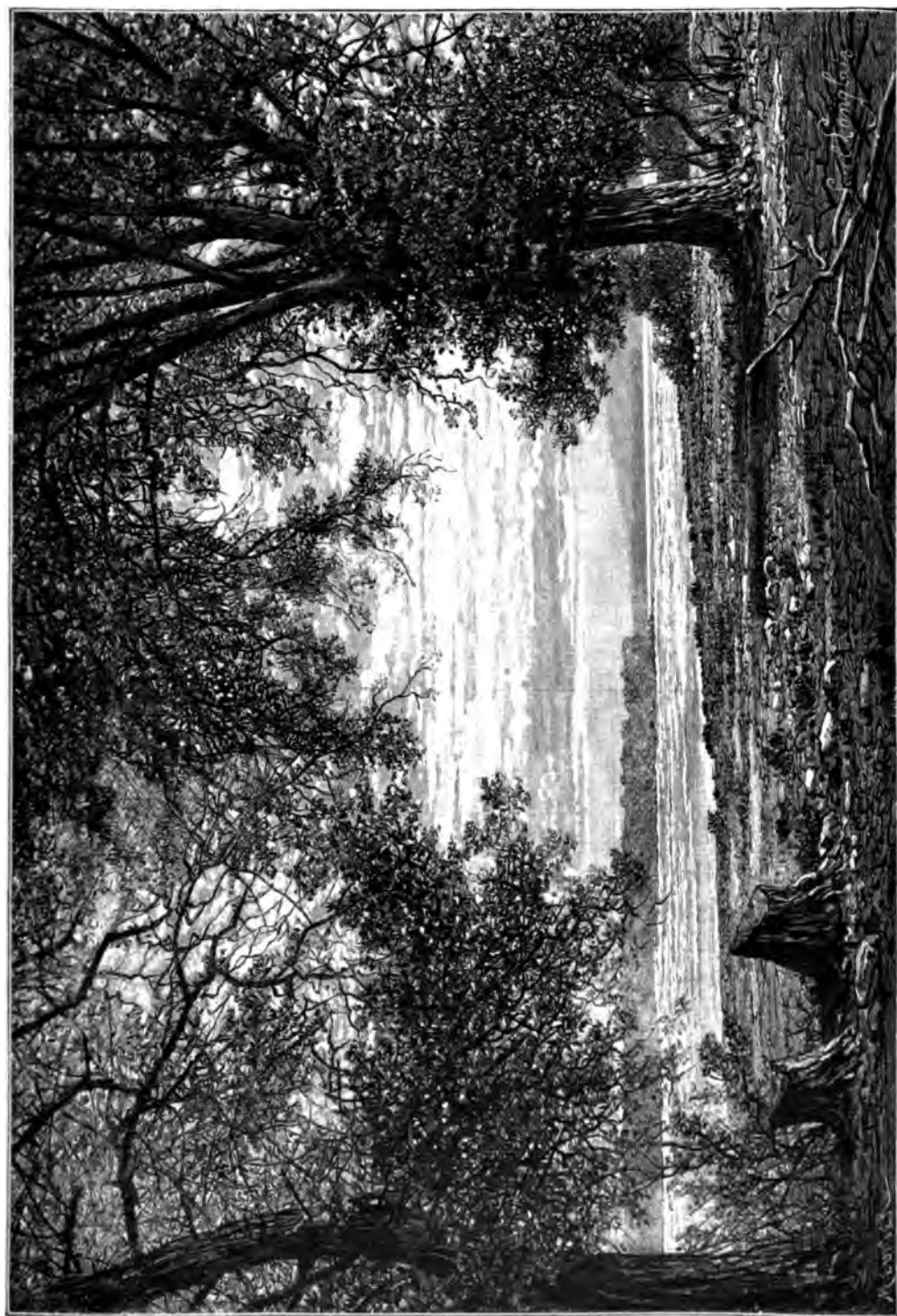
VOLCANIC SYSTEMS.

Viewed as a whole the New World presents a remarkable contrast between its western and eastern seabords, the former bristling with igneous cones, the latter long quiescent (except in the Antilles) and slowly eroded by the sea. Nevertheless, the burning mountains are irregularly distributed along the west coast, and the chain is in many places broken by wide gaps. A first curvilinear range, fully as symmetrical as that of the Kuriles and Kamchatka on the Asiatic side, sweeps through the Aleutian archipelago, and is continued by other cones on the Alaskan mainland. Then follow southwards along the west coast huge mountains of lava still emitting vapours, although their cirques and craters are already filled with glaciers. Such, for instance, is Mount Wrangel, north-west of Mount St. Elias. North of the Columbia river rises a third volcanic group not yet entirely at rest, but almost extinct when compared with the formidable craters which formerly discharged mighty lava streams in these regions.

South of British Columbia and along the shores of California the few still smoking cones are insignificant in comparison with the great volcanic fissure surmounted by active craters which traverses Mexico from ocean to ocean. The region of isthmuses from Guatemala to Costa Rica is also intersected by an igneous chain indicating a subterranean zone in a state of permanent combustion. South America abounds even more than the north in centres of plutonic action, presenting in Columbia, the Bolivian plateau, and Chili three chief regions of fiery eruptions and underground disturbances. Lastly, in some of the lesser Antilles a few active cones rise between the Atlantic Ocean and the inner basin of the Caribbean Sea.

Judging from the frequency and violence of the explosions the volcanoes of the isthmian region would appear to correspond with those of the Malay Archipelago on the other side of the globe. The distance between these two centres of disturbance comprises exactly one-half of the terrestrial circumference, and the two igneous chains of Costa Rica and Java are about equidistant from the equinoctial line, the former to the north, the latter to the south of that line. The planet would thus seem to have two fiery poles, each coinciding with a region of transition between two continental masses.

* Belt, *A Naturalist in Nicaragua*.



OTTAWA RIVER—VIEW TAKEN AT THE SAUT DU CARILLON.



DISPOSITION OF THE ZONES OF TEMPERATURE.

As in the Old World, in the New also, the greater part of the dry land lies in the northern hemisphere, as if it had been drawn northwards by some attractive force emanating from the Arctic Pole. The equator passes far to the south of the connecting islands and isthmuses just above the Amazons river, which has often been designated as the "movable equator." To the north is thus left nearly eleven, to the south less than six million square miles. The consequence is that the temperate zone, the most favourable for the development of human culture, occupies in North America the broader part of the land, while in the south it is confined to the relatively narrower spaces tapering southwards to Cape Horn. But in other respects the land is less favourably distributed in the north than in the south. The vast extent of the Arctic regions renders a great part of North America almost uninhabitable, whereas the narrow southern extremity is the only inhospitable tract in South America. Formerly the two limits of European colonisation were the banks of the St. Lawrence in the north and those of the Plate river in the south. At present the latter limit has been left far behind, whereas the "Hauteur des Terres" between the St. Lawrence and Labrador has not yet been crossed. Both extremities of the New World are carved into fjords, but in the Austral division these formations occur only to the south of Chili, while in North America they begin on the west side with the St. Juan de Fuca Strait, and on the east with the St. Lawrence estuary.

The tropical zone intermediate between the two temperate zones includes but a small part of North America properly so-called, but it comprises all Central America, the West Indies, and over one-half of the southern continent. This area of excessive heats and, in the wet regions, of rank vegetation, is naturally far less favourable to human progress than the lands enjoying a more temperate climate. Nevertheless, the torrid regions of the New World are indebted mainly to the neighbourhood of the sea for a special climate milder and more equable than that of the African and Asiatic countries lying under the same latitude. Thus the islands and isthmuses of the Caribbean Sea are distinguished by an essentially maritime temperature.

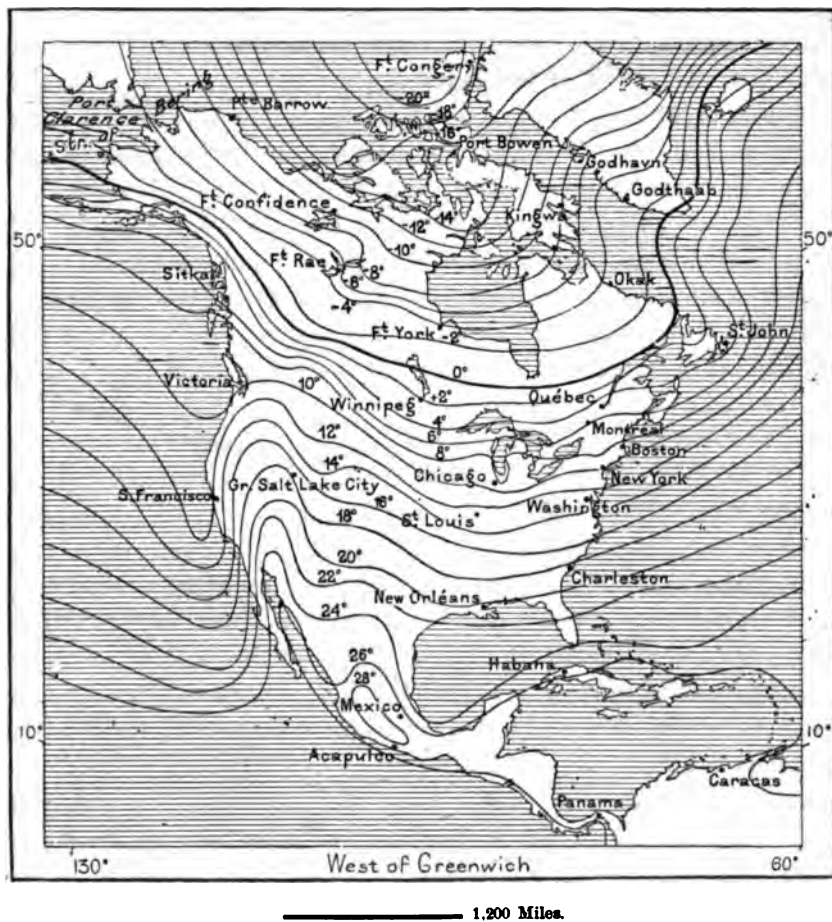
A considerable section of equatorial America consists also of uplands, plateaux, and highlands, where again the great elevations with their cooler atmosphere compensate for the normal climatic conditions on the lowland plains. Thanks to their altitude many regions of the tropical zone are thus brought within the temperate sphere. Such, for instance, is the Mexican tableland, whose normal temperature at sea-level would be as high as 82° or 83° Fahr. But the moist and hot lower regions remain everywhere unfavourable to human advancement. Thus the magnificent Amazons river, the most copious on the globe, flows for the most part through solitudes, although the plains comprised within its basin might amply suffice for the sustenance of all the inhabitants of the planet.

CLIMATE—MARINE CURRENTS.

Compared with that of the Old World, and especially of Europe, the American climate is characterised chiefly by its lower mean temperature. Under corresponding latitudes it is colder, at least in the northern hemisphere, the difference in certain places being as much as fourteen degrees. While the thermal equator of Africa and Arabia exceeds 86° or 88° Fahr. it falls below 80° in the hottest parts of the

Fig. 13.—ISOTHERMALS OF NORTH AMERICA.

Scale 1 : 80,000,000.



New World. But this discrepancy between both sides of the Atlantic does not prevail uniformly throughout the year, and, in fact, is far less perceptible in summer than in winter. In the month of July the heat is as intense in the United States as under the same latitudes east of the Atlantic, but in January the glass falls as low on the banks of the Mississippi as on the Norwegian seaboard. Snow lies for months together on the ground at St. Louis and Washington under the same parallel as Lisbon, Messina, and Smyrna, places where snow is never seen

except on the tops of the neighbouring heights. To meet the winter climate of New York on the European seaboard the observer must ascend some twenty degrees nearer to the North Pole.

This remarkable contrast is due to atmospheric and marine influences, which have now been carefully studied. In West Europe the prevailing winds blow from the south-west, that is, from the tropical regions of America, and the marine currents set in the same direction. From the Caribbean Sea and equatorial waters they flow north-eastwards without appreciably affecting the climate of North America; they act only on the West European seaboard as far as Scandinavia and even Spitzbergen, while the coast of North America is washed by a cold current from the polar regions. Nevertheless, the course of these marine streams is far from being constant, nor can their progress be calculated, as Maury supposed, like that of a projectile discharged from the cannon's mouth. They are often displaced, retarded, or accelerated, are complicated by backwaters or counter-currents, undergo the thousand influences of climate, and in their turn react on the alternation of the seasons.

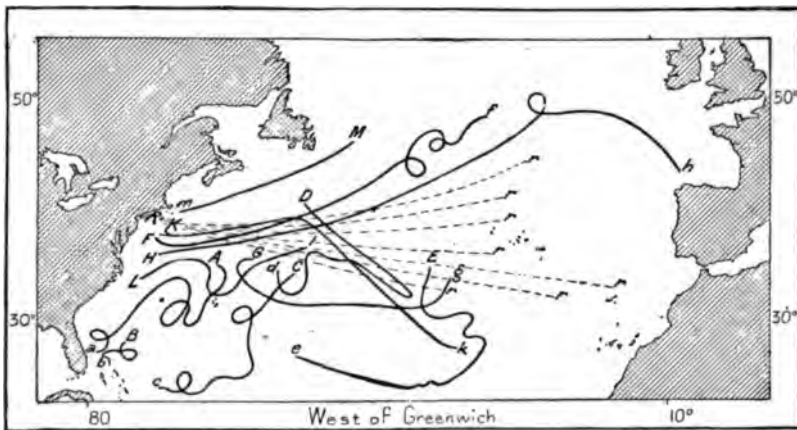
The hydrographic researches conducted especially under the direction of the United States Bureau of Navigation have shown that even the Gulf Stream, one of the chief factors in determining the climate of West Europe, is far from being so uniform, at least on the surface, as was at one time supposed. In many places under the shifting surface currents, the deeper waters have been observed to move along in a regular channel. Numerous spars and even abandoned vessels describe sinuous tracks, at times even returning to their first course under the influence of counter-currents. Hulks have thus drifted from Bermuda towards Florida in the opposite direction to the main stream, which sets from America towards Europe. About the end of 1887, an accident revealed the general direction of the oceanic current west of Long Island at that time, when the whole body of water was found to be moving almost due west and east under the latitudes of New York, the Azores, and Lisbon. A gigantic raft, consisting of 27,000 trunks of trees, 200 yards long, and weighing 11,000 tons, was broken up and sent adrift during a fierce gale, and the observations taken showed that over 500 of the fragments had spread out in the form of a fan in the direction of the Azores. In 225 days the flotsam had drifted some 3,500 miles, spreading north and south, under the meridian of Flores, about eleven degrees of latitude between the 34th and 45th parallels.

Other currents skirting the American seaboard produce effects analogous to those of the Gulf Stream and polar current, diversely modifying the continental climate according to the windings and varying velocity of their course. Thus the Kuro-sivo, or "Black Stream," which corresponds in the Pacific to the Gulf Stream of the Atlantic, determines on the west coast of North America climatic phenomena similar to those of Western Europe. Its tepid waters setting from Japan eastwards, strike the seaboard south of Alaska, and thence sweep southwards along the shores of Oregon and California. But as it advances from colder to warmer seas, it mingles its waters with those coming from the Arctic regions,

and is thus gradually changed to a cold current. On the tropical coasts, it cools the atmosphere, and tempers the torrid heats. The Kuro-sivo, however, is even less uniform than the Gulf Stream. It is not originally developed in a well-defined basin, such as the Gulf of Mexico, nor does it assume near its source the aspect of a river flowing between solid banks. It sets sluggishly across the Pacific, moving at a slower rate than the corresponding current in the North Atlantic.

Like those of North America, the east and west seabords of South America are also exposed to the influence acting in different ways on the climate. Thus the west side is washed by an Antarctic current, whose cold waters temper the heats of the coastlands as far as the Equator. On the other hand, the east coast receives into its gulfs the tepid waters brought by a branch of the great equatorial current, which, after crossing the Atlantic from east to west, ramifies at Cape St. Roque into two secondary branches, one penetrating north-westwards into the Caribbean Sea, the other setting southwards to the La Plata estuary.

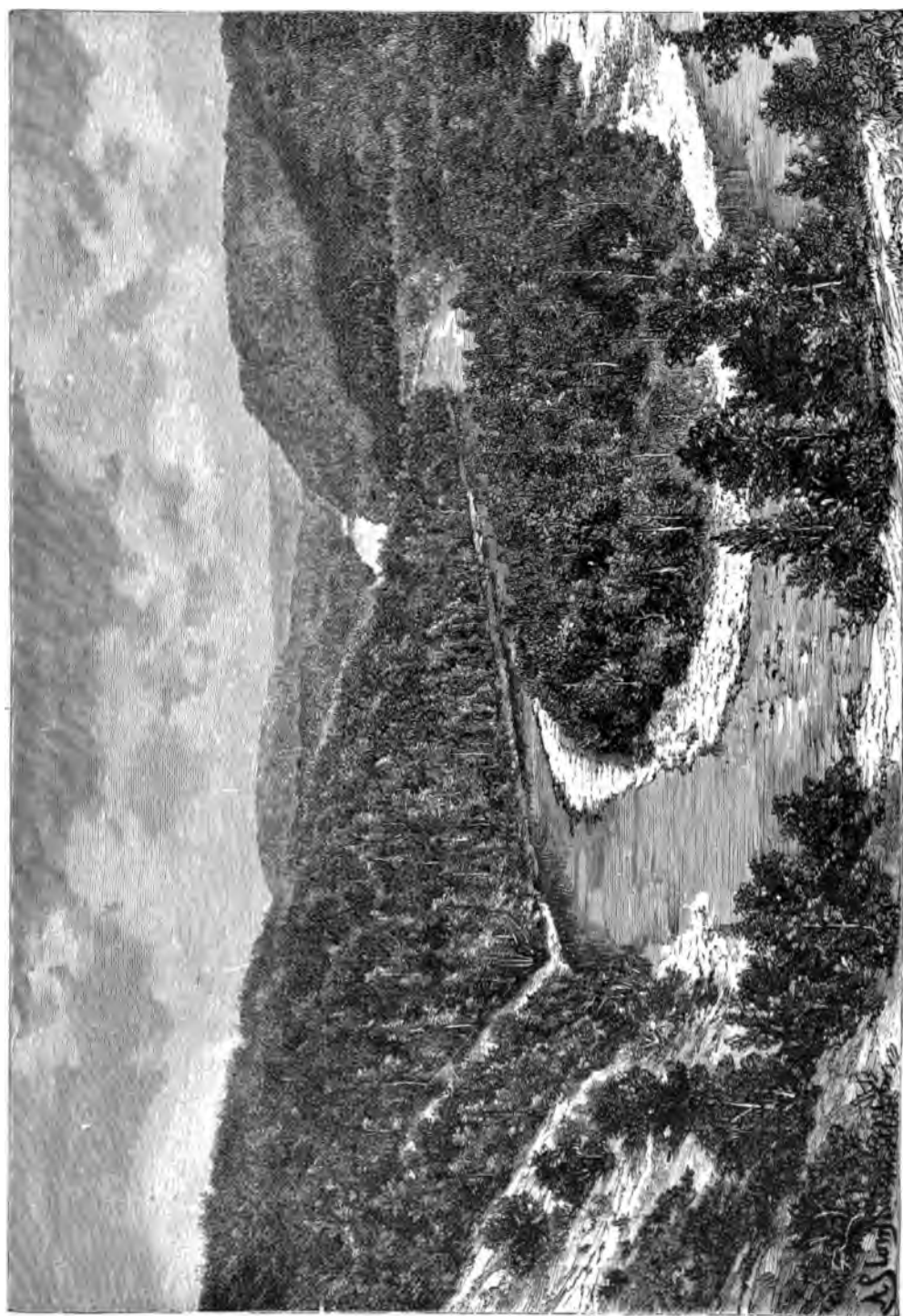
Fig. 14.—APPARENT ANOMALIES IN THE SURFACE CURRENT OF THE GULF STREAM.



The full lines indicate the course followed by floats.
The dotted lines indicate the course followed by the fragments of the great raft.
The capitals indicate the starting-point, the small letters the terminal point of floats.

Thus, of the four chief currents affecting the American climate, two raise and two lower the temperature of the seabords. But these effects are produced, so to say, in diagonal fashion, the east side of North, and the west side of South America receiving cold streams, while the west side of the former and the east side of the latter are washed by tepid waters.

Thanks to the triangular form of its two main divisions, no part of the New World lies at any great distance from the surrounding oceans, so that a certain degree of moisture is brought by all winds to the interior. Hence the only absolutely rainless tracts are those where the rain-bearing clouds are intersected by lofty ranges, and compelled to precipitate their contents before proceeding farther. On the whole, the rainfall is heavier in the New than in the Old World, as shown by the prodigious volume of waters discharged by the American rivers.



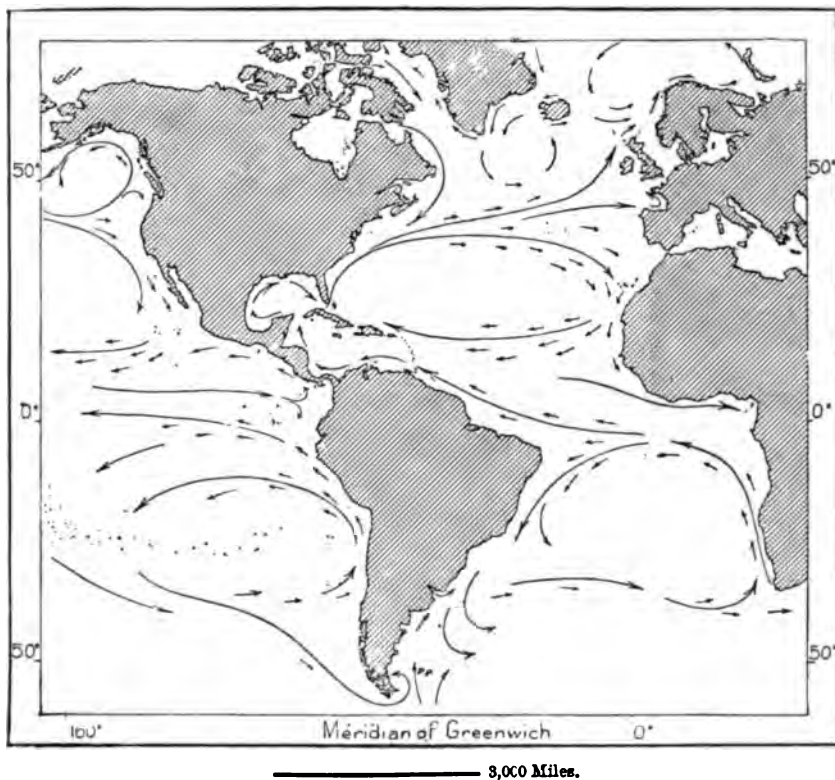
ST. MARGARET AND THE STONY RIVER, CANADA.



Of these the Amazons is the largest in the world; but others also, such as the St. Lawrence, Mississippi, Orenoco, and Parana, have few superiors or even rivals amongst the watercourses of the opposite hemisphere. Doubtless no such tremendous downpours have yet been recorded in any part of America as those which fall on the Tcherraponjie Hills in the Brahmaputra basin. But the enormous discharge of the Atrato into the Gulf of Urabà, at the north-west angle of South America, makes it far from improbable that here the annual rainfall is fully equal to that measured in Gangetic India. In an equal area the Atrato

Fig. 15.—CHIEF CURRENTS OF THE AMERICAN SEAS.

Scale 1 : 175,000,000.



sends down a volume of water twenty-three times greater than that of the Seine.

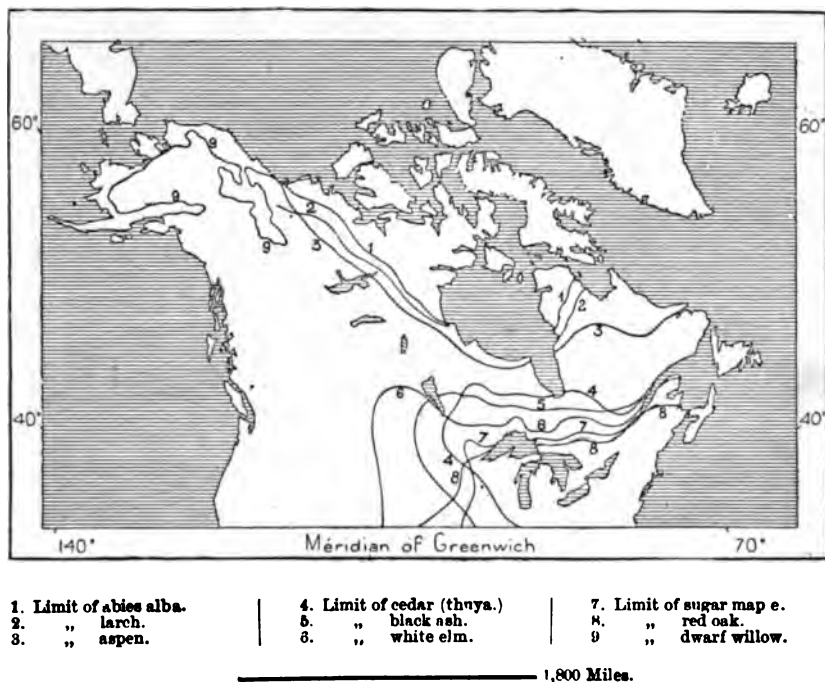
Dry tracts with poor or arid soil occupy a great part of the North American plains and plateaux stretching west of the Mississippi. But deserts, properly so called, occur only about the Gulf of California, and along the Chilian and Peruvian coasts, on the outer terraces of the Andes, sheltered from the rains by the lofty rampart of the Cordilleras rising to the east. But how insignificant are these uninhabitable districts compared with the vast chain of sandy spaces occupying the greater part of a diagonal zone which extends in the Old World from Adrar on the north-west coast of Africa all the way to Chinese Manchuria.

FLORA AND FAUNA.

From the disposition of the twin continents stretching north and south across every climatic zone it might already be inferred that their flora must be relatively more diversified than that of the Old World. In fact, notwithstanding its much smaller extent, America comprises nearly as many vegetable zones clearly marked by the presence of characteristic genera and species. From the frozen islands of the north to its austral extremity it presents every variety of vegetation, passing from the lowly mosses and lichens, the miniature forests of dwarf birch and willow of the arctic lands to larger growths gradually increasing in size in Canada and

Fig. 16.—LIMITS OF FOREST VEGETATION IN NORTH AMERICA.

Scale 1 : 75,000,000.



the United States. Here trees of deciduous foliage prevail in the south and east, replaced chiefly by the conifer family in the western regions of British Columbia, Oregon, and California. Some of these, such as the sequoia, acquire gigantic proportions, rivalling in girth and height the Australian eucalyptus.

Under the same latitudes stretch the less abundantly watered prairies, boundless grassy plains now largely brought under tillage, and elsewhere followed by arid plateaux with growths of saline plants like those of the seashore. In Mexico and Central America the vegetable zones assume a vertical disposition, rising from the "hot lands" of the periphery to the "cold lands" of the interior. The Antilles also, as well as the southern mainland and the Andes, have each their special floras. The Amazons basin is almost entirely occupied with dense woodlands almost

impenetrable except by the natural routes of the river-beds. No other region of the globe is clothed with such vast tracts of verdure, and this is the home of arboreal vegetation in a pre-eminent sense, specially named "Hylæa" by botanists. In the more southern temperate zone the araucarias of the plateaux are succeeded by the grassy pampas corresponding to the North American prairies. Patagonia again has its peculiar flora, as has also Tierra del Fuego, with its stunted beeches, its trailing shrubs and lichens.

Like its flora, the American fauna is highly diversified, thus corresponding to the endlessly varied conditions of soil and climate. Birds, fishes, amphibians, reptiles, insects of all kinds are represented in prodigious multitudes. The mammals also are numerous, although the large species characteristic of Asia and Africa have no analogous forms in America. The naturalists of the eighteenth century had already remarked that in this narrower world the animals are of smaller size. Yet America had its mastodon in a recent geological epoch, while in the tertiary period the Rocky Mountains were inhabited by dinocerata of prodigious dimensions.* Now, however, the New World has no quadrupeds comparable to the elephant, rhinoceros, or giraffe, although amongst its wild animals there are some of considerable size. Such are the white polar bear and the grisly bear of the Rocky Mountains, the Canadian wapiti and moose deer, the jaguar of the tropical regions, commonly spoken of as the American "tiger." In the same way the puma, llama, and nandou or rhea have been respectively called the "lion," "camel," and "ostrich" of the New World, the same types being in fact represented by distinct species in the eastern and western hemispheres.

As a centre of evolution South America contrasts favourably with the north, possessing a large number of animals not found in that region. The latter has only 700 species of birds, while the former has no less than 2,300, and the contrast between the fishes is still more striking. In this respect the North American waters resemble those of Europe and Asia, whereas the species peculiar to the south are reckoned by the thousand. A single lake contains as many as all Europe, and in the Amazons basin alone Agassiz collected as many as 2,000 distinct forms.

INHABITANTS.

From one extremity to the other of the New World the various divisions of the aborigines present the most surprising uniformity of type. Excluding the Eskimo, regarded by many ethnologists as an Asiatic race closely allied to the Chukches of north-east Siberia, all the inhabitants of America appeared at the time of the discovery to constitute a single ethnical group. Whatever local differences may exist between northerners and southerners, between cultured and savage peoples, between hunters and tillers of the soil, whatever divergences may have been produced by social usages and their 450 distinct languages, the natives have almost without exception certain physical traits in common, notably that dark coppery complexion from which those of the north have received the

* O. C. Marsh, *The Gigantic Mammals of the Order Dinocerata*.

name of "Red Skins." All have straight black hair never crisp or wavy, and all have a grave demeanour, slow action and pulse less rapid than the inhabitants of the Old World. Their common relationship is further shown by the prevailing angular face, massive jaw, prominent superciliary arches, aquiline nose, strongly marked features differing little between the sexes, broad and relatively powerful chest. Such is the so-called "Indian" type, differing profoundly from that of the true East Indians, with whom they were confounded in the imagination of Columbus and his Spanish successors.

CONSEQUENCES OF THE DISCOVERY.

The discovery of the New World had a far greater influence on the destinies of mankind than could have at first been foreseen. Without America the human family remained incomplete, history sought without finding its unity. Reduced to about a sixth of its real size and destitute of the great navigable highways which give ubiquity to its inhabitants, the globe seemed infinite precisely because its limits were unknown. But what an expansion was given to the field of human knowledge when America, emerging from darkness, took its place between Europe and China, and when the terrestrial surface was at last clearly defined! So long as man was ignorant of his position in space and even regarded his domain as immeasurable, all theories on the nature of things were necessarily false, and scientific progress became impossible.

What could astronomy lead to when, despite the teachings of a few philosophic heirs of Greece and Egypt, the world continued to be commonly regarded as a solid plane supporting the firmament, or else as the centre round which revolved the sun and stars? And with astronomy all the associated sciences were doomed to rest on pure conjecture, depending not on mathematical certainty but on miracles or the flights of fancy. The Middle Ages would thus have been indefinitely prolonged, probably involving intellectual and moral death. But what a quickening of intellectual life, what an impulse to study and progress of all kinds when man became aware by the direct evidence of his senses that the earth swam in ether, a planet amongst the planets, one of the myriad particles wandering in boundless space! The influence exercised by the discoveries of the Columban age was great in virtue of the actual knowledge revealed to humanity; it was far greater through its indirect action in advancing the intellectual emancipation of mankind.

SPREAD OF MODERN CULTURE TO THE NEW WORLD.

Even from the material point of view the year 1492 brought about considerable changes in both hemispheres. The aspect of the land has been modified by the clearing of forests, by plantations, the growth of towns, the development of highways, the migration of plants and animals between both sides of the Atlantic basin. In respect of animals America has received far more than she has given, obtaining in exchange for a single domestic bird, the turkey, all the numerous

species of the Old World associated with man, the elephant and camel alone excepted. Moreover, representatives of the respective wild faunas—forest birds, marine, fluvial and lacustrine fishes, insects of all kinds, have passed intentionally or not from hemisphere to hemisphere. Uncultivated plants carelessly imported with merchandise or agricultural produce still continue their migrations, and if most of them perish in their new environments, a certain number gain a footing and even end by exterminating the native forms. And here again the Old World has been the greater benefactor, largely assimilating America in its flora as well as in its inhabitants. If in Europe the railway embankments have been overgrown by the Canadian erigeron, if many canals in England, France, and Germany have been obstructed by the “water pest” (*anacharsis alsinastum*), the American plateaux have in their turn been invaded by the European thistle, while half of the northern continent has been overrun with the clover from the shores of the Gulf of Mexico to the Rocky Mountains.

All cultivated species, with but few exceptions due to climate or other local causes, have become common to both worlds. America now grows all European fruits, mostly in greater abundance than in Europe itself; the Arabian coffee-plant and Indian sugar-cane, also, are more productive than in the Old World. To America, on the other hand, we are indebted for the maize and the most widespread variety of tobacco, as well as the potato, cinchona and many other medicinal plants. By way of compensation for the destructive phylloxera, she has also supplied the vigorous stock by which the exhausted European vineyards are now being renovated.

FATE OF THE ABORIGINES.

Changes, analogous to those effected in the flora and fauna, have also taken place in the native American populations, who have been violently thrust aside, and even, in many regions, exterminated by the intruders from the Old World. Of the aboriginal tribes, many are known to have perished, and the arrival of Columbus in the Antilles was the signal for the wholesale disappearance of the insular people. Tracked by bloodhounds, forcibly baptised and thus made the “spiritual brethren” of the Spaniard, but none the less condemned to statute labour in the mines and on the plantations, bound as serfs to the glebe, distributed in herds amongst the conquerors, and subjected to the Inquisition, the unhappy natives were speedily reduced to the condition of abject slaves. Española and Cuba, where they had numbered hundreds of thousands, were transformed to solitudes; whole tribes were seen to renounce all civilisation, take refuge in the woods and revert to the savage life of their ancestors. Others sought in suicide an escape from the atrocious oppression of the foreigner,* and now the question is discussed whether there still survive, anywhere in the islands or on the mainland, a few half-caste descendants of the primitive insular populations. Their memory is, nevertheless, perpetuated in a considerable number of familiar words bequeathed to Spanish, and through it, to all the languages of Europe.

* Las Casas, *Historia de la destruccion de las Indias*.

The atrocities begun in the West Indies were continued in many parts of North and South America. Many hundred thousands perished at the hands of Cortez, Pizarro and other conquistadores, by whom whole districts were often

Fig. 17.—DOMINANT RACES IN AMERICA.

Scale 1 : 115,000,000.



depopulated. Nor were the Spaniards the only delinquents, and if some, such as the Portuguese, shed less blood than others, the fact was due not so much to their sense of pity or justice, as to the conditions of the regions occupied by them and sparsely peopled by wandering tribes taking refuge from their oppressors in their

remote woodlands. Elsewhere systematic slaughter was replaced by gradual encroachments on the native territory, which, in the long run, produced the same results. The aborigines of the United States east of the Mississippi have either completely disappeared, or are now represented only by a few scattered "Reserves." Wherever the conditions of life are irreconcilable, the struggle for existence continues to the advantage of the whites; the hunter inevitably yields to the agricultural and industrial labourer. Millions of natives have also been swept away by alcoholic drinks, smallpox and other epidemics introduced from Europe.

But even in those regions where the aborigines have not been entirely destroyed, their original civilisation has ceased to exist. Many cultured communities have reverted to barbarism, or else have adapted themselves to alien social systems. The expeditions, battles and massacres of which Cortez, Pizarro and others were the heroes, drew the attention of contemporary observers to the powerful states overthrown by the conquerors. But while the local civilisations were exciting wonder, they had already disappeared. Yet the Mexicans had displayed great engineering talent in the construction of embankments, causeways, canals, aqueducts, sewers. They possessed fine highways along which a postal service was organised, compared to which analogous European institutions were still in a rudimentary state; they were skilled workers in gold, silver, copper and other metals; their astronomic science enabled them to divide their year into eighteen months of twenty days with five complementary days, thus making three hundred and sixty-five exactly; they recorded national events by painting and sculpture, and even made use of hieroglyphic characters. But all these products of art and science were regarded by the ignorant Spanish priests as the work of the devil, and consigned to the flames. The continuity of history was thus broken, and the mass of the people reduced to ignorance and slavery.

So also in Peru, the descendants of the Quichuas and Aymaras preserved nothing of those industries which had enabled them to construct vast edifices, to lay down broad paved highways along the flanks of the mountains, to cast and chase the metals. And what remains of the ancient civilisations developed by the Chibchas of Columbia, the Mayas of Yucatan, and the kindred Quiches of Guatemala? These nations, however, at least still exist, although in a degraded state, whereas many other cultured populations have totally disappeared. In the impenetrable and now uninhabited forests have been discovered the grandest temples, the choicest sculptures of the New World, and in the Sierra Nevada de Santa Marta the splendid paved roads found at remote distances from all habitations are now frequented chiefly by the tapir, peccary and jaguar.

DOMINANT ETHNICAL ELEMENTS.

Despite the conquest, many native races still survive, protected here and there by swamps, forests, mountains or the local climate. At present, in more than half of the New World, the majority of the population are descendants of the old owners of the soil. According to the political constitutions of the Hispano-

American States, differences of origin are not held to be bars to civil equality. The natives themselves have in fact acquired the right to rank on a level with their conquerors, either by fighting side by side with the rebels against Spanish rule, or by taking part in all the civil wars by which the new states have been convulsed. Whatever be the pretensions of certain sections of the community, there can scarcely exist in Latin America any really pure race, for the first European immigrants from Mexico to Chili nearly all married native women, and since then twelve generations have followed, diversely modified by unions between every shade of half-breeds. The American populations, which in virtue of these unions belong at once to both races, may be estimated at about thirty millions altogether.

But a third ethnical element must also be taken into account, for the negro has also contributed to people the New World, though not as a free immigrant. The blacks captured on the African seaboard and sold to American planters have been roughly estimated at about fifty millions, and, in any case, they far exceeded in numbers the European immigrants down to the close of the last century. But most of the new arrivals were swept away by disease, oppression, and hardships of all kinds, their race was perpetuated mainly by successive fresh importations, and at present the Africans are far less numerous in America than either the whites or the Indian half-castes. Nor have they, any more than the redskins, preserved their racial purity; nearly all those of the West Indies, Brazil, and even the United States, have by crossings become an intermediate race, people of "colour" rather than blacks, numbering altogether about twenty millions. In Haiti, however, where alone they have acquired political autonomy, more than half of the inhabitants are classed as "blacks," relatively to the other citizens of lighter complexion. But even if they have remained physically pure Africans, they have been Europeanised, if not in habits, at least in institutions and language.

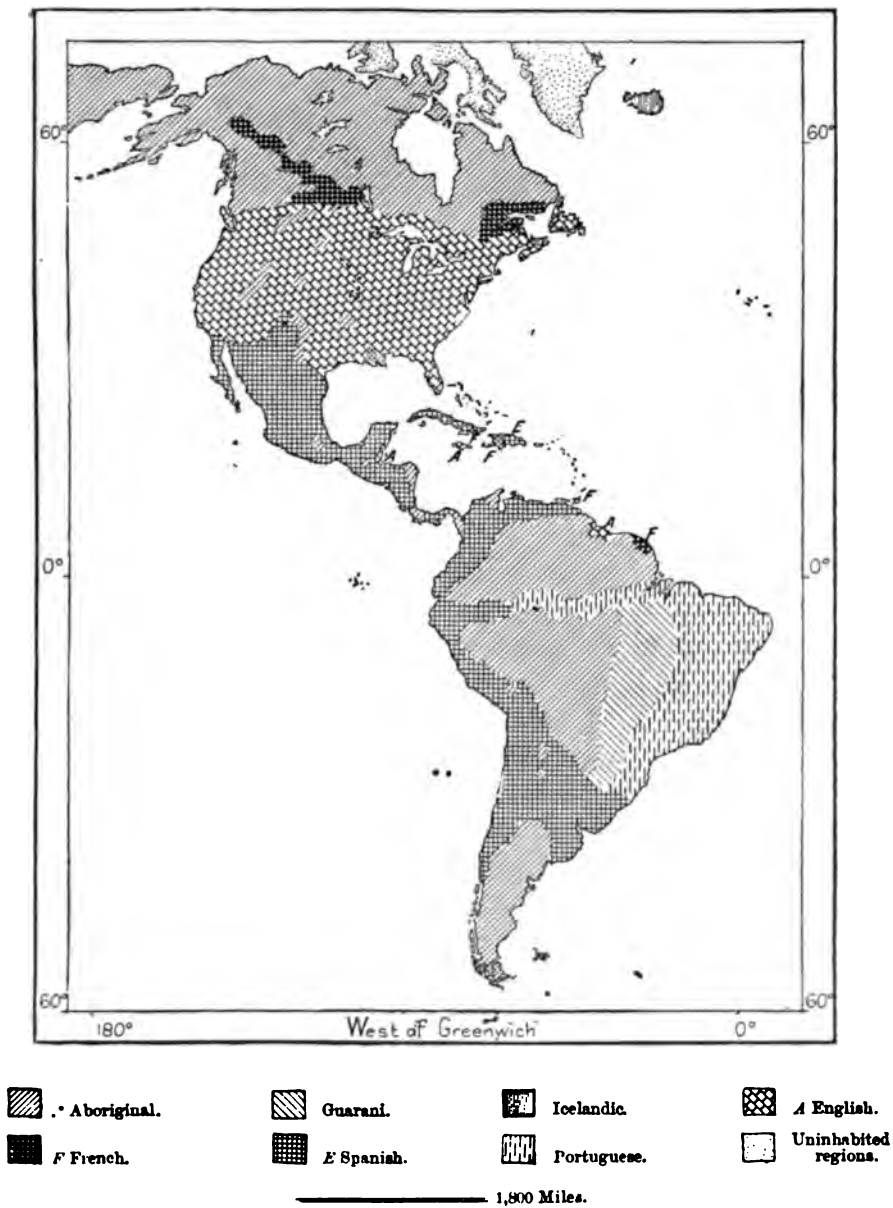
Speaking generally, the great bulk of the population in Latin America may be regarded as consisting of three elements—European whites, African blacks, and the aborigines diversely fused in a new race. In the United States and British America, on the contrary, social feeling maintains an impassable barrier, especially between the whites and blacks, a barrier which since the emancipation has been strengthened rather than weakened. There can be no doubt that in the Southern States, for instance, political causes, such as the granting of universal franchise to the negro, have tended to widen the gap between the antagonistic elements. The illicit unions, common enough on the plantations before the abolition of slavery, have mainly ceased, with the result that the mulatto is dying out or becoming absorbed in the true black, the whole race thus showing a distinct tendency to revert to the pure African type.

Thus, from the standpoint of the progressive blending of the ethnical elements, the New World is divided into two distinct sections, very unequal in extent and in no way coinciding with the natural divisions. These two sections are frequently designated by the names of Anglo-Saxon and Latin America, from the dominant peoples, or rather from the chief languages current amongst them—English in the

north, the two Latin languages, Spanish and Portuguese, in the south. But as regards the origin of the peoples themselves, these expressions can have but a very relative value. The "Anglo-Saxons," taking the term in its widest sense,

Fig. 18.—CHIEF LANGUAGES OF AMERICA.

Scale 1 : 115,000,000.



doubtless enjoy a decided majority in the domain attributed to them; but the "Latins," represented especially by Spaniards and Portuguese of Iberian, Keltic, or Ligurian stock, are almost effaced in the presence of the multitudes of other

peoples surrounding them—Europeans of every nationality, Africans and American aborigines.

Moreover areas of different speech occur in both domains. Thus the unity of the English-speaking division is broken by Lower Canada and some districts in North America, while in the south several of the Antilles, as well as British Guiana, lie beyond the Hispano-American world. Of the two divisions the Anglo-Saxon is the smaller in extent, but immeasurably the more important in population, industrial and commercial activity, and political power. This disparity tends also to increase from decade to decade, so that the time would seem to be approaching when the whole of the New World will be brought under the direct or indirect influence of the English-speaking section. As if in anticipation of their future destiny the people of the United States already claim the title of "Americans" in a pre-eminent sense.

PROGRESSIVE EUROPEAN IMMIGRATION.

It was long ago remarked by Kohl that the peoples of West Europe shared in the New World the work of discovery and settlement, proceeding in an order from north to south corresponding to their respective positions in the Old World. Thus the Scandinavians (Danes, Icelanders, and Norwegians) occupy the shores of Greenland, and to them is due our first knowledge of the mainland southwards to and beyond the St. Lawrence. Then follow the English and the French, contending for the possession of Canada and the Mississippi basin. Lastly come the Spaniards and Portuguese, sharing between them the rest of America.

But the populations of Central, and even of East, Europe have also aspired to take their part in the rich inheritance revealed to them beyond the seas, and colonists were thus attracted from every civilised land. In almost every American village are found representatives of these various countries, and most of the towns have more inhabitants of foreign origin than natives. Hence the astounding rapidity with which the more fertile regions of the temperate zone have been peopled, the population having increased threefold since 1825 in many of these more favoured parts. The annual arrivals are now reckoned by hundreds of thousands, and in some European countries the movement of transatlantic migration may almost be described as a veritable exodus. Certain parts of America scarcely inhabited two hundred years ago, or occupied only by a few hunting tribes, are already as densely peopled as many industrial centres in Europe.

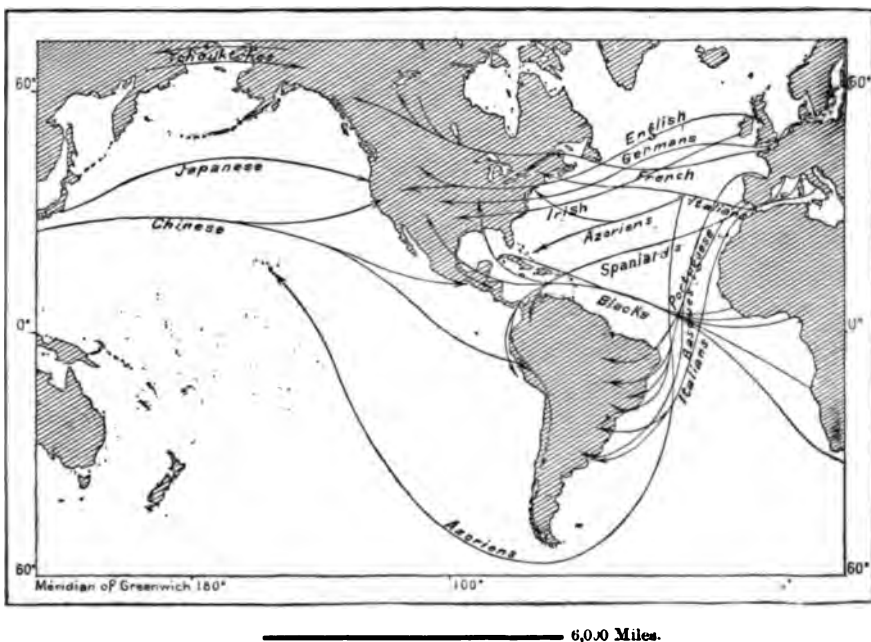
This universal migratory movement is naturally determined by climatic conditions, for the mortality of colonists everywhere increases in direct ratio with the difference between the climates of their old and new homes. Scandinavians, Englishmen, Germans, even southern Frenchmen, cannot venture without risk to settle in tropical lands, where their physical and moral energies are impaired and where the family dies out unless renewed by fresh arrivals. On the other hand the Africans perish in the cold regions of North and South America. But the history of colonisation clearly shows that there still remain many broad lands well

suited for settlement by the various ethnical groups of the Old World. Thus the French live, labour, and thrive as well under the isothermals of 35° or 36° Fahr. in the Winnipeg basin as under those of 72° in the Mississippi delta. So also with other Europeans who find in America a habitable zone where the total range of the temperature presents far greater extremes than in their native land.

Colonists from the European temperate regions have, moreover, the choice in the New World of two suitable regions, one in the northern, the other in the southern hemisphere. Whether they settle on the banks of the St. Lawrence, or on those of the Plate River, at the foot of the Californian mountains or of the

Fig. 19.—OCCUPATION OF AMERICA BY IMMIGRANTS FROM THE OLD WORLD.

Scale 1 : 250,000,000.



Chilian Andes, they find themselves equally in an environment adapted to their constitution. The fact that America is disposed in the direction from north to south, transversely to the line followed by civilisation in the Old World, has modified the course of history by broadening the various streams of European migration, and directing them at once to both hemispheres. Nor does the race appear to have in any important respect degenerated since its occupation of America. Changes have been noticed in the complexion, the carriage, the sound of the voice, but it has not been shown that the whites long settled in the temperate parts of the New World are inferior to the average European in height, strength, endurance, or beauty; they are as long-lived, and the women are equally prolific.*

* Shaler in Winsor's *America*.

DECADENCE OF THE SPANISH POWER.

The discovery of America, followed by its entanglement in the rivalries and vicissitudes of the Old World, naturally proved disastrous to the destinies of the very people from whom it had received its first navigators, conquerors and colonists. One of the first consequences of this event, which opened to commerce the new highways of the west, was to close those hitherto followed in the east. Thus Columbus, Vespucci and Cabot, unwittingly brought ruin on their Italian native land. Genoa, after the fall of Constantinople, had already lost its trade route by the Black Sea, and Venice had to abandon its eastern factories after the navigation of the Atlantic was established. While the spice monopoly was seized by Portugal, thanks to the discovery of the Cape of Good Hope, the trade in gold fell into the hands of Spain and was transferred from the Old to the New Indies. The Italian oligarchies were thus overtaken first by financial, then by political decadence, and the Peninsula entered on a long era of decay, misery and servitude. And if ruin overwhelmed the Christian agents of eastern traffic, how much more were the eastern peoples themselves involved in the calamity! Vasco de Gama, Columbus, Magellan inflicted a deadly blow on the Mohammedan States, through which had hitherto passed the exchanges between India and Western Europe. Henceforth removed from the great stream of commerce, the Mussulman world sank into hopeless decline.

Spain and Portugal themselves, at first benefited by the discoveries and prematurely declared masters of the world by the bull of Pope Alexander VI., began also to decay soon after obtaining possession of those vast domains abounding in spices, gems and the precious metals. They doubtless imported gold by the ton, as much as two billions sterling between 1492 and 1775; but this sudden wealth fostered a love of display and a taste for gambling, created monopolies, fomented speculation and brought industry into contempt. The moral worth of the nation diminished with the increase of its treasures. Yet Spain, first of European powers in military strength and resources, seemed in the middle of the sixteenth century irresistible, and fear was entertained lest Philip II. might by force or intrigue realise his visions of universal monarchy.

But the chief mainstay of his powerful political engine was already broken. The various states of the Iberian Peninsula, which had hitherto enjoyed a large measure of autonomy, and whose liberties no king had hitherto dared to violate, were henceforth absolutely prostrate at the feet of the monarch. All local energies had been suppressed, all citizens transformed to soldiers, officials, or subjects of no more account before the power of the sovereign than all those nameless peoples assigned to him by the papal bull. During the brilliant period following the conquest of Grenada, the expulsion of the Moors and the discovery of the New World, the dazzling glory of the new monarchy had seemed ample compensation for the loss of freedom, and the Spaniards had yielded without complaint to the whims of royalty, and even to the terrible inquisitions of the tribunal of the "Holy Brotherhood." But at the close of the sixteenth century,

when the vital forces of the nation had been exhausted on the European battle-fields, and in expeditions beyond the seas, Spain had no longer any hands available for industrial pursuits. Her Moorish artisans had been banished the land, and the Christian craftsmen stood idle. The kingdom continued to receive consignments of gold, but was unable to export manufactured wares in return; hence it was fain to appeal to the stranger for those articles it had ceased to produce. Thus the wealth of Mexico and Peru flowed out to Flanders, Germany, France and England, while Spain herself was compared to the Arcadian ass, "laden with gold but feeding on thistles." Her mercantile navy, which at the beginning of the sixteenth century comprised a thousand vessels, had been gradually impoverished and swept from the seas, for the squadrons had also disappeared which should have accompanied the convoys and protected them from the ubiquitous English privateers. Spain was crushed beneath the weight of her colonial empire, from which it was a relief to be at last delivered by foreign wars and revolutions. Colonies and metropolis mutually ruined each other, and the same was also true of Portugal and its old political dependency, Brazil.

ASCENDENCY OF THE ANGLO-SAXON RACE.

In North America beyond Mexico, England and France were the suzerain powers, and it long remained doubtful to which would ultimately fall the empire of the continent. French colonisation, directed, so to say, towards the interior by the course of the St. Lawrence, had advanced step by step to the heart of the land, descending seawards from the headwaters of the Mississippi. It was thus developed in a vast semicircle sweeping round from the St. Lawrence estuary to the Gulf of Mexico. But so thin was the zone of population that this circuit of some 2,500 miles was little more than a slender line traced in the wilderness and interrupted at intervals, especially towards the summit of the curve.

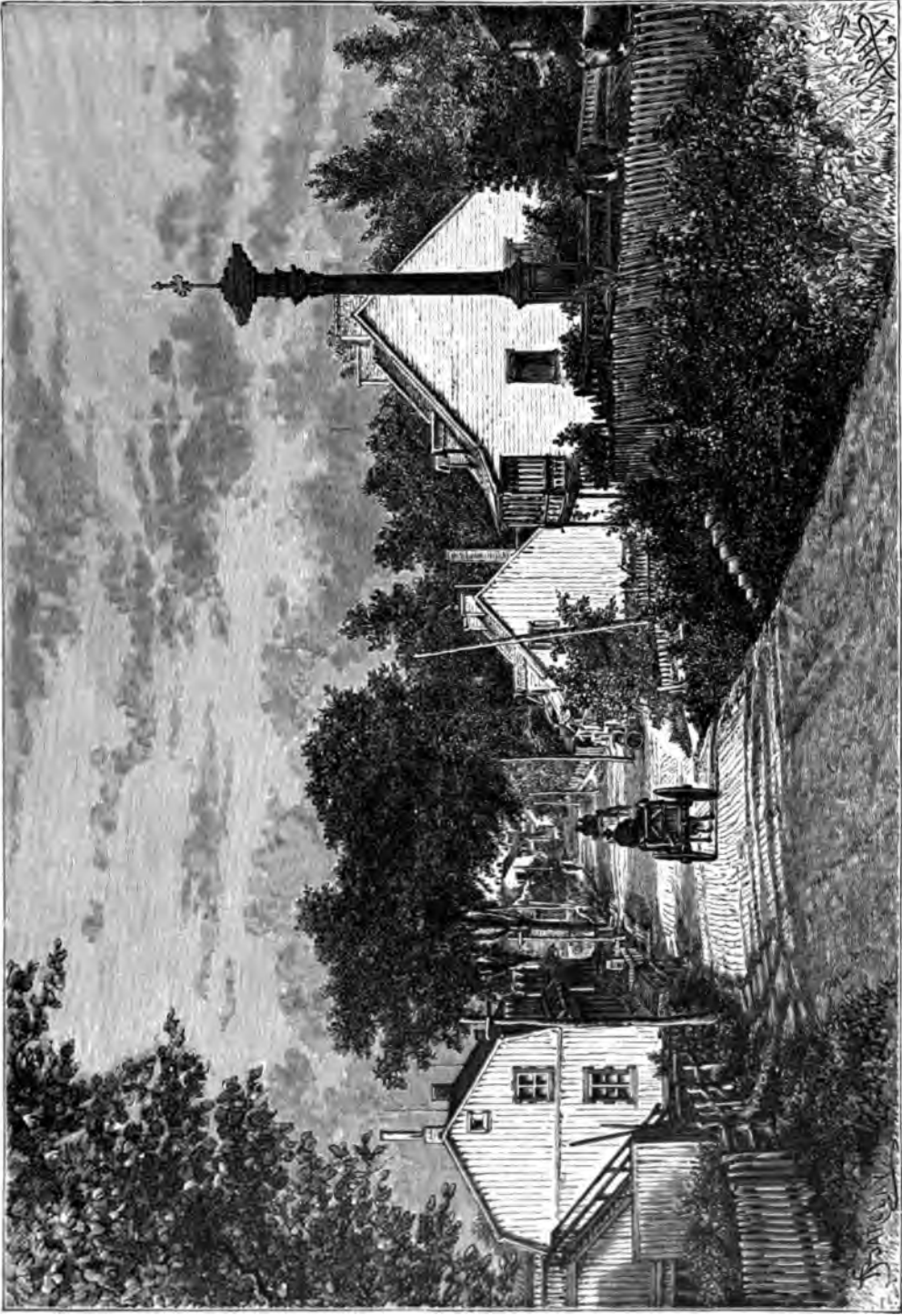
On the other hand the English colonies, as well as those of Holland and Scandinavia, soon destined to be merged in the former, had been founded on the Atlantic seaboard, and from this solid base they had gradually spread in a compact mass inland, always in free communication with the sea, and nowhere presenting a vulnerable point along their periphery. The respective position of the rival nations thus indicated beforehand the result of the conflict. Apart from circumstances foreign to the colonies themselves—diplomatic talent and high statesmanship, military genius, superiority of forces sent to the aid of the settlers, integrity of administrators—it was evident that the more compact colony, with the stronger strategic position, and at the same time the more densely peopled, must prevail in the long run. At the time of the cession of Canada to England the British settlements had a population of 2,500,000, while the French of the St. Lawrence numbered only 60,000 souls.

The English-speaking colonies were even strong enough to sever their political connection with Great Britain, and achieve their independence by force of arms. After nine years of desultory warfare the United States of America were firmly

constituted, and by a remarkable turn of events the French Canadians also succeeded in maintaining their effective independence. During the revolutionary war the inhabitants of Canada had remained loyal to England, and had even resisted the appeal to rebel made by the French allies of the revolted British colonics, and this loyalty was rewarded with the recognition of their full administrative autonomy. They were thus enabled to develop a new France far better than if they had remained under the direct dominion of the mother country, exposed to the caprice of royalty, harassed by all manner of laws and regulations, in the framing of which they could themselves have had no share. French influence has increased in North America precisely in proportion to the political independence of the French Canadians.

Still more emphatically may it be asserted that the English world has expanded in virtue of the independence and prosperity of the United States. Since the establishment of its political autonomy the great republic has presented a picture of progress in wealth and population, such as has never before been witnessed. Within a single century the new State has become in some respects the most powerful in the world, although possessing merely nominal land and sea forces, and scorning to line her seaboard with bristling fortresses. In many industries she already takes the foremost rank, and aspires to outstrip all peoples in the arts of peace. Despite the manifold origin of the inhabitants, their common work is usually held to be the outcome of Anglo-Saxon energy, and rightly so, for the English mould in which American society has been cast has converted the continent into a "Greater Britain," enjoying the same traditions, the same language and literature, the same laws and love of freedom as the mother country. It is chiefly through the United States that English is yearly acquiring more and more that character of a universal language which it already possesses in the commercial world, and which it aspires to as the medium of intercourse between all civilised peoples. The English-speaking communities in the British Isles, the United States, Canada, Australia, South Africa, the West Indies, Guiana and elsewhere, are yearly increased by a population of from two to three millions, and already half the letters passing through the post-offices of the world are written in the English language. Even the Spanish American republics have to submit to the Anglo-Saxon hegemony in their political institutions and the general tendency of their civilisation.

"America for the Americans!" Such is the retort of the States of the New World to the attempts of European powers to intervene in the internal affairs of the western world. From the political point of view the question may even be regarded as already set at rest. The American republics, with which Brazil has now (1889) thrown in her lot, have no longer to fear attack from any quarter, and the time may not be distant when they may even cease to tolerate the existence of colonies depending directly on a foreign government. If Great Britain still possesses officially one-fourth of the New World, the greater part of this vast domain is an almost uninhabited wilderness, while the settled provinces constitute a practically independent commonwealth, in which the suzerain power is represented by an empty title.



A CANADIAN VILLAGE- BEAUFORT, NEAR QUEBEC.



Their political autonomy is consequently secured to the peoples of the New World. But from the social standpoint America is the inheritance of all the colonists from the Old World, who have made it a new home, introducing their traditional customs and usages, their aspirations, their hopes, and the power of adapting themselves to a new environment. Those who call themselves "Americans" to distinguish themselves from other cultured peoples are themselves the descendants of Europeans, whose numbers are annually increased by over a million through the excess of births over the mortality, and by nearly another million by fresh immigrants chiefly from the British Isles and Germany. The transatlantic world is a field of experiment for the Old World, and in it will probably be solved many social and political problems for the common benefit of all mankind.





CHAPTER II.

GREENLAND.



EOGRAPHICALLY speaking, Greenland occupies an intermediate position between Europe and the New World; it is even scarcely more distant from the European island of Iceland than it is from the Polar Archipelago of America. Nevertheless, the general disposition of its seaboard as well as the conformation of the land connect it with the western islands and constitute it a fragment of North America.

Its isolated condition is due to the girdle of ice by which it is completely encircled for two-thirds of the year and almost severed from the habitable world. With an area equal to that of the British Isles, France, and Central Europe, or about 870,000 square miles, it has a population of probably little more than ten thousand, including the native families not subject to the jurisdiction of the Danish officials.

The name of "Green Land," given by Erik the Red to this inhospitable region in the hope that a name of good omen might attract immigrants, has not had the desired success. For over nine centuries the expression has rather conveyed a sense of irony, and the name of "Desolation Land," applied to it by Baffin, is certainly better justified by the actual conditions. Nevertheless, the original designation has held its ground, even though the land itself had been long forgotten by seafarers. Of all the names given by the Norsemen to their discoveries in the New World before and after the year 1000 this eccentric term alone persists in common usage.

HISTORIC RETROSPECT.

Greenland was discovered by Gunnbjorn and the banished Erik the Red at the close of the tenth century, five hundred years before the time of Columbus. The first Scandinavian immigrants were still pagans; but at the beginning of the eleventh century Leif, son of Erik, returned from a visit to Norway in company with a priest, by whom the viking and all his thanes were baptized. About this time a large number of Icelanders settled in Greenland, where they were grouped in two

districts, separated by an uninhabited tract. These two districts of the West and East—*Westerbygd* and *Osterbygd*—have not been determined with absolute certainty, some indentifying them with the settlements founded on both coasts, others, far more probably, with stations on the west coasts, one at a point projecting westwards, the other on the Gulf of Igaliko, or the “Abandoned Houses,” lying near Cape Farewell, east or south-east of the other colonies. This hypothesis is even regarded by Rink as beyond all reasonable doubt, and in any case the presence of the Scandinavian settlers is attested by some sixty old structures and runic inscriptions.

Most of the Greenland runes preserved in the Copenhagen Museum were found near the southern extremity of the island; but in 1824 one was discovered in a district north of Upernivik itself, that is, beyond the last group of huts occupied by the civilised natives, on the summit of Kingiktorsoak Island in $72^{\circ} 55'$ north latitude. These inscriptions have not been very clearly made out, although the form of the characters, compared with those of Norway, shows that they evidently date from the eleventh or twelfth century. In 1881 a Norse ruin, bearing the name of Narssak, or the “Plain,” was also found by the missionary, Brodbeck, on a fjord a little east of Cape Farewell. Narssak was no doubt one of the fourteen or sixteen churches erected by the Scandinavians in Greenland for the inhabitants of the 280 villages or hamlets founded in the two districts of *Westerbygd* and *Osterbygd*. At the beginning of the twelfth century a cathedral church, depending on the see of Bremen, was also built at Garde not far from the southern extremity of the land.

Social, trading, and religious relations were maintained for four hundred years between the two Scandinavias of Europe and America. But these relations were gradually weakened and at last brought to a close by the action of the Norwegian Crown, which had seized the Greenland colonies in 1261, destroying their old republican liberties and establishing a complete commercial monopoly. Trade was henceforth restricted to a single royal vessel, the *Grönlandsknarra*, so that a shipwreck, a war, a succession to the throne, an epidemic, or other accident sufficed to interrupt all communications. Thus it happened that Greenland ceased to be visited after the “black sickness,” which ravaged North Europe at the close of the fourteenth century. The very name of Erik’s domain was forgotten, or preserved only in legendary tradition and indicated at haphazard on contemporary maps. The desire to revisit the land was not awakened till after the great discoveries of Columbus and his rivals.

PROGRESS OF DISCOVERY.

The first attempts made by the Scandinavian mariners to recover their old colonies were not successful, and the renewal of exploration in the waters between Greenland and the Polar Archipelago was due to Sebastian Cabot, Frobisher, and Davis. In the seventeenth century the Danish seafarers resumed their efforts in the hope of discovering the mines of the precious metals reported by Frobisher.

through the fringing ice, and Egede Land, so named from a descendant of the missionary who sighted its shores from afar, still remains the least-known part of South Greenland.

Nevertheless, De Blosseville, commander of the French ship, the *Lilloise*, struck the seaboard about the 68th parallel in 1831, and followed it for some distance, but next year he perished with his vessel crushed between the pack-ice. Operations were renewed in 1879 by Captain Mourier, a Dane, who reported some lofty mountains under $67^{\circ} 6'$ and $68^{\circ} 10'$ north latitude. In 1822 Scoresby, one of the ablest of Arctic explorers, skirted the north-east coast for about 400 miles in a straight line; his accurate chart was later revised and completed at certain points by Clavering and Sabine, and again by the German expedition which discovered the extensive Franz-Joseph Fjord.

Since 1876 the exploration of the seaboard has been systematically conducted by learned naturalists, who have studied the form and elevation of the coastline, the depth of the neighbouring waters, the phenomena of natural history, and the customs of the natives. Thus has been completed the survey of all the west side beyond Upernivik, and a beginning has been made with the east side. But the interior remains almost entirely unknown. Few of the numerous attempts have succeeded to penetrate far across the snowy wastes. In 1728 a governor, ignorant of the true character of the country, had imported some horses from Denmark and mustered a company of soldiers to march overland to the east side, where he expected to find the descendants of the old Norse settlers; but the horses, objects of wonder for the Eskimo, all perished before the cavalcade could start. Twenty-three years later the trader, Lars Dalager, scaled the glacier north of Frederikshaab, but only passed three nights on the ice.

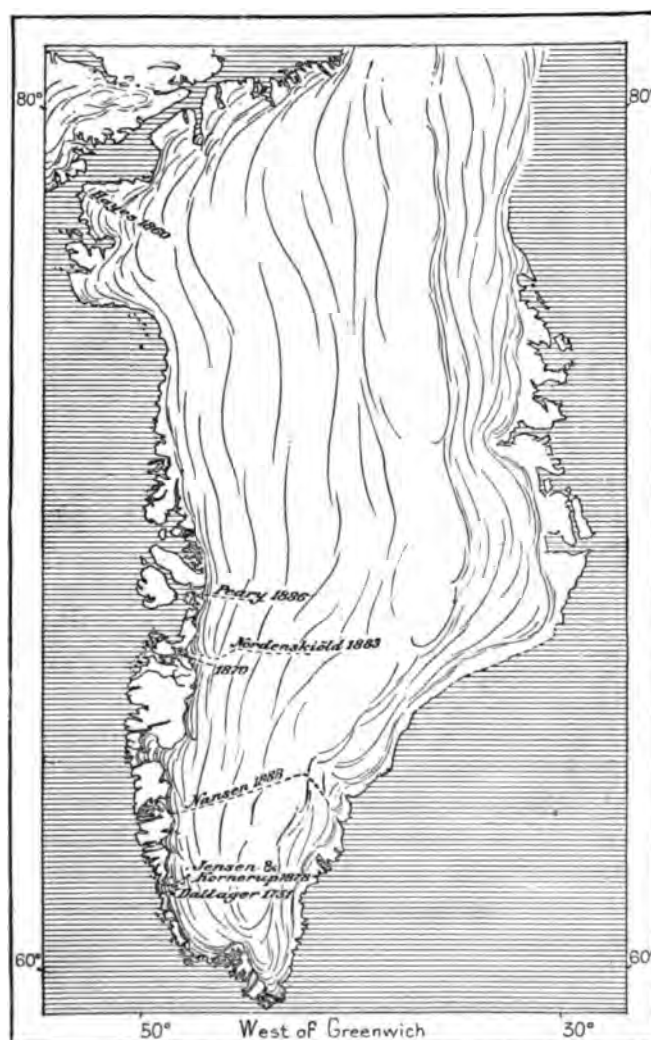
Over a century elapsed before these attempts were renewed. In 1860 Hayes, leaving his ship at anchor in Smith Channel, made his way about 60 miles inland to a point over 5,000 feet above the sea, where he was arrested by a snow-storm. In 1867 Whymper, the Alpinist, and Dr. Robert Brown vainly essayed to reach the interior from Jakobshavn; but in 1870 Nordenskiöld and Berggren were more successful, advancing some days' march east from Egedesminde across dangerous crevasses and running waters. Again in 1883 Nordenskiöld pushed farther inland, while his Lapp guides reached the centre of Greenland, traversing 270 miles in 57 hours and rising to a height of 6,400 feet above sea-level. At last the Norwegian, Dr. Nansen, succeeded in 1888 in crossing from the east to the west coast, attaining at one point an altitude of about 10,000 feet. Although it was summer the temperature oscillated between -40° and -57° Fahr., but despite this intense cold, often aggravated by the high winds, the heroic band reached the Ameralik Fjord near Godthaab after a fearful journey of forty-six days across glaciers, frozen plateaux, and vast snowfields.

EXTENT—PHYSICAL FEATURES.

Although its outlines are now accurately known almost everywhere except on the north-east side, it is impossible to estimate the actual extent of Greenland

without a probable error of several thousand square miles. The land being almost entirely covered with an ice-cap, it is quite uncertain whether the projections along many parts of the seaboard are true headlands or mountains surrounded by plains rather than islands connected with the mainland by glaciers. It has even

Fig. 21.—EXPEDITIONS INTO THE INTERIOR OF GREENLAND.



(f) Inland Ice-fields.

300 Miles.

been suggested that the whole of Greenland may be nothing more than a vast archipelago bound together in a compact mass by a superstructure of thick ice and snow. Formerly the fjord into which Frobisher penetrated in 1572 was regarded, not as an inlet of one of the Arctic islands, but as a strait traversing the southern peninsula of Greenland. In support of the insular hypothesis appeal

has also been made to the statements of fishers claiming to have captured in the western fjords whales that had been harpooned by others in the eastern water.

Nevertheless, the detailed study of the west coast, which is free from ice for a considerable distance, makes it sufficiently evident that Greenland proper really forms a continuous mass of land. The existence of coast ranges, whose crests are seen towering above the ice in regular lines, the homogeneous character of the rocks examined in various parts of the country, the form of the inlets along the seaboard, the general disposition of mountain and plateaux, all imparts to Greenland an aspect greatly resembling that of Scandinavia. In both regions the formations are the same, and they would present an analogous appearance were the western land disencumbered of its icy fetters. As in Norway, the coastline is fringed with ramifying peninsulas continued seawards by islets and little insular groups, and these are the lands which, with the advance and retreat of the glaciers, may alternately be attached and separated from the mainland.

The geological history of the seaboard offers numerous examples of these changes—*islands that have become promontories or even snow-clad mountains, and which have again been detached; fjords filled up by glaciers and again set free; gulfs which have been transformed to lakes, and which after many years or centuries have re-established their communications with the sea.* Such changes, caused by the alternation of seasons and climatic periods, are so rapid in some fjords that the charts prepared at different times all present considerable discrepancies in the contours of the mainland. In the northern parts visited by the Greely expedition the forms of the insular groups appear to have undergone the greatest modifications in their icy integument. Here several parallel straits separating elongated islands would seem to have been entirely filled by the ice-pack from the Paleocretic Sea and frozen ocean.

Throughout their whole length the coastlands are mountainous and of forbidding aspect. Even the southernmost point at the extremity of an archipelago is a gloomy mountain, the Kangak Kyrdlek, or Umanarsuak of the natives, to which the English seafarers have given the name of Cape Farewell, and which the Scandinavians call Statenhuk. North of this headland the west coast is dominated by long serrated ranges with crests "sharp as sharks' teeth." The mean altitude of these crests scarcely exceeds 1,600 feet, but in the interior of the southern point the peaks attain an elevation of over 7,500 feet. The inhabited regions in Danish territory have summits exceeding 3,000, and in some places even 4,000 and 5,000 feet, but north of the polar circle the mountains are less elevated in the region of deep fjords stretching north of Disko Bay. Here the seaboard rises in gentle slopes towards the ice-fields of the interior. But the rugged island of Disko itself, the largest on the west coast, presents crests and domes rising above 3,300 feet. Still farther north the peninsula of Nursoak has summits of 6,000 feet, while the peaks of gneiss on the neighbouring mainland rise to heights of 6,500 feet and upwards. Beyond this point the coast range falls, although the gaze of mariners is here attracted by the eccentric form of the "Devil's Thumb,"

a lofty eminence terminating in a sort of obelisk. According to Kune the *Arctic Highlands* north of Melville Bay nowhere exceed 2,000 feet; on the east side of Smith Channel Hayes ascended a peak 4,170 feet high, and Nares attributed a height of 6,000 feet to a summit in Washington Land, the peninsula skirting the east side of Kennedy Channel.

The east side of Greenland, indented like the west with fjords and fringed with islands, is the loftier and more precipitous of the two, and here rises the highest mountain hitherto discovered. In 1870 the German expedition under Koldewey penetrated into an unknown fjord, the mouth of which was masked by over a hundred icebergs. This long and winding inlet, which was named the Franz-Joseph Fjord, is dominated by steep escarpments from 6,000 to 7,000 feet high, and consists of horizontal layers interspersed with quartz, schists, and

Fig. 22.—CAPE FAREWELL.

Scale 1 : 1,000,000.



15 Miles.

limestone. Towards its western extremity in the interior of the continent the pyramidal mass named Mount Petermann rises, according to Payer, to an altitude of at least 11,000 feet. Other summits of like elevation probably occur elsewhere, for the explorers have already observed domes 10,000 feet high in the southern regions, where Greenland is much more contracted than in higher latitudes. The backbone or waterparting between the two slopes, placed by Nordenskjöld near the west coast, is by Rink and most other authorities removed to the opposite side, presenting its more precipitous slope towards the Atlantic.

GEOLOGICAL FORMATION.

Most of the uplands denuded by the melting snows or retreating glaciers consist of crystalline rocks, such as gneiss, granites, and porphyries. The gneiss of the Franz-Joseph Fjord contains enormous crystals of garnet like those erratic

blocks in Iceland which were perhaps transported by ice. In this part of Greenland the series of rocks is the same as in Spitzbergen, a tract of jurassic formation here also occurring associated in like manner with carboniferous deposits and fossil plants. Some chalk beds underlying miocene strata have been observed on the west coast, while various parts of the seaboard are strewn with basalts ejected, as in Europe, during the tertiary epoch.

Near Godhavn in Disko Island a basalt escarpment rises nearly vertically to a height of 2,000 feet, and above it is seen the bluish section of a glacier overhanging the precipice, and from time to time sending down enormous blocks of ice. The basaltic columns exposed to the action of the waves here affect the strangest forms—causeways, peristyles of temples, cathedral naves where the billows break with fury. It was at Ovifak near the foot of a basalt cliff in Disko that Nordenskjöld found the three huge blocks of iron, one weighing 24 tons, which he removed to the museum of Stockholm. These blocks, till recently supposed to be of meteoric origin, are now generally believed to have been associated with the eruptive basalts and dolerites occurring in the same district and also interspersed with iron of the same description. According to John Ross similar blocks are found on the shores of Melville Bay, where the material is utilised by the natives for making knives.

Despite the abundance of old igneous rocks, no active volcanoes have yet been discovered in Greenland; and although jets of hot water occur at Unartok in the south and elsewhere, none of those "very copious" thermal springs have been found, near which stood the monastery mentioned in the travels of the brothers Zeni. By means of irrigating rills the monks raised vegetables, fruits, and flowers, such as could be produced nowhere else in the country; the hot water flowing seawards also formed a harbour free from ice, frequented in winter by myriads of aquatic birds.

The islands mentioned in the sagas as existing between Iceland and Greenland have by some been identified with those designated by Graah as the "Gunnbjorn Reefs," while others have suggested that they may have been volcanoes blown to pieces since historic times by an explosion like that of Krakatau. The chart prepared by Ruysch for an edition of Ptolemy published in 1507 indicates in these waters the site of an island, which was said to have been "completely burnt in 1456."

THE INLAND ICE-CAP.

Till recently Hooker, Payer and others supposed that the interior of Greenland presented vast spaces free of ice, grassy valleys where herds of reindeer grazed, and popular legends were appealed to in support of this view. Nordenskjöld also suggested that the phenomenon might be explained by the action of the winds, which after crossing the inland ranges descended in warm currents like the *föhn* of Switzerland, and thus melted the snows of the valleys. But the systematic researches made in recent years have failed to discover any of these inland oases. The whole land appears, on the contrary, to be covered with a continuous ice-cap

fringed by glaciers which move down the outer valleys to the neighbourhood of the sea, or to the fjords of the periphery. The valleys themselves have disappeared and despite local irregularities the ice-cap slopes like a shield uniformly towards the interior. Thus in certain places the explorer should expect to meet elevations of 7,000 or 8,000 feet; but owing to an optical illusion he scarcely knows whether he is climbing or descending. The horizon seems to rise on all sides, says Nordenskjöld, "as if he were at the bottom of a basin."

The aspect of these boundless wastes rolling away in scarcely perceptible undulations, and in the distance mingling the grey of their snows with the grey of the skies, at first gave the impression that Greenland was a uniform plateau, a sort of horizontal table. The belief now prevails that the rocky surface of the land is on the contrary carved into mountains and hills, valleys and gorges, but that the plastic snows and ice have gradually filled up all the cavities which now show only in slight sinuosities on the surface. Allowing to the whole mass of the ice-cap an average thickness of 500 feet, it would represent a total volume of about 150,000 cubic miles. This *sermer suak*, or "great ice" of the Greenlanders, flows like asphalt or tar with extreme slowness seawards, while the surface is gradually levelled by the snow falling during the course of ages and distributed by the winds. In the interior of the country the surface of the ice and snow is as smooth as if it were polished, looking like "the undisturbed surface of a frozen ocean, the long but not high billows of which rolling from east to west are not easily distinguishable to the eye."* Nevertheless the exterior form of the ice-cap has been greatly diversified at least on its outer edge, where in many places it is difficult to cross, or even quite impassable. The action of lateral pressure, of heat produced by the tremendous friction, of evaporation and filtration has often broken the surface into innumerable cones a few yards high in form and colour resembling the tents of an encampment. The depressions of the snowy plateau are filled with meres, lagoons, and lakes; streams and rivulets excavate winding gorges with crystal walls in the snow and ice. Cascades, frozen at night, plunge during the day into profound crevasses; during the expedition of 1870 Nordenskjöld saw intermittent jets of water rising to a great height, which he was unable to study, but which he supposes must be geysirs.

Moraines occur, not on the inland icefields, but only at the foot of the glaciers and in the immediate vicinity of the fall. Not a single stone is to be seen on the vast expanse at any distance from the coast. But the so-called *nunatak*, rocky eminences dreaded by the Eskimo as the abode of ghosts, rise in certain places like islands above the surrounding snows, and when these melt under the summer heats the observer is surprised to find the eminences overgrown with mosses and even flowering plants. Jensen met short grasses, the *carex* and *saxifrage*, as well as the *ranunculus* and poppy sheltered beneath the mosses of one of these *nunatak*, whose humble fauna consisted of a butterfly's larva and two spiders. A solitary bird had been borne by the storm to this isolated rock, which stands 4,400 feet high, about 24 miles in the interior of the icefield. The existence of these

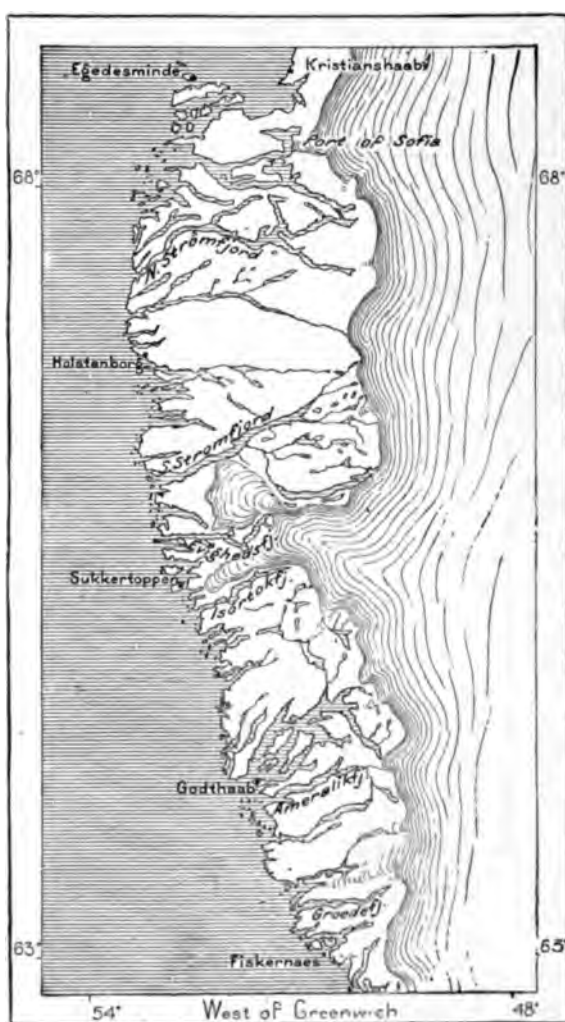
* Nansen, *Proceedings of the R. Geographical Society*, August, 1889.

little centres of vegetable and animal life amid the boundless snows is one of Greenland's mysteries. But the very snows themselves have their organisms, as shown by yellow and red patches on the surface of glaciers and *névés*, the colour of which is due to the presence of myriads of animalculæ. The inland ice is also pierced by innumerable little holes of varying size filled at the bottom with drops of water and a bed of grey dust, on which grow numerous microscopic plants. This dust, which Nordenskjöld has called cryokonite, or "ice powder," is so abundant that its mass certainly represents many tons per square mile, and imparts a greyish tint to the icefields. It consists of refuse of all kinds brought by the winds, and would also appear to contain substances of cosmic origin, especially the dust of meteors traversing the atmosphere of the globe.

Notwithstanding the slight general tilt of the land the Greenland ice-cap is certainly in motion. All the changes of equilibrium, however produced, have the result of displacing the particles in the direction of the incline. When the ear is applied to the surface a muffled sound is heard, accompanied by sharper notes like those of distant explosions. These are the echoes of streams flowing in the lower depths, of blocks of ice falling into the cascades, of crevasses opening or closing. All the movements are necessarily propagated from the higher to the lower levels, so that the whole mass is gradually thrust by gravity and lateral pressure from the region of the waterparting down to the seaboard.

Fig. 23.—PART OF GREENLAND FREE FROM ICE.

Scale 1 : 5,500,000.

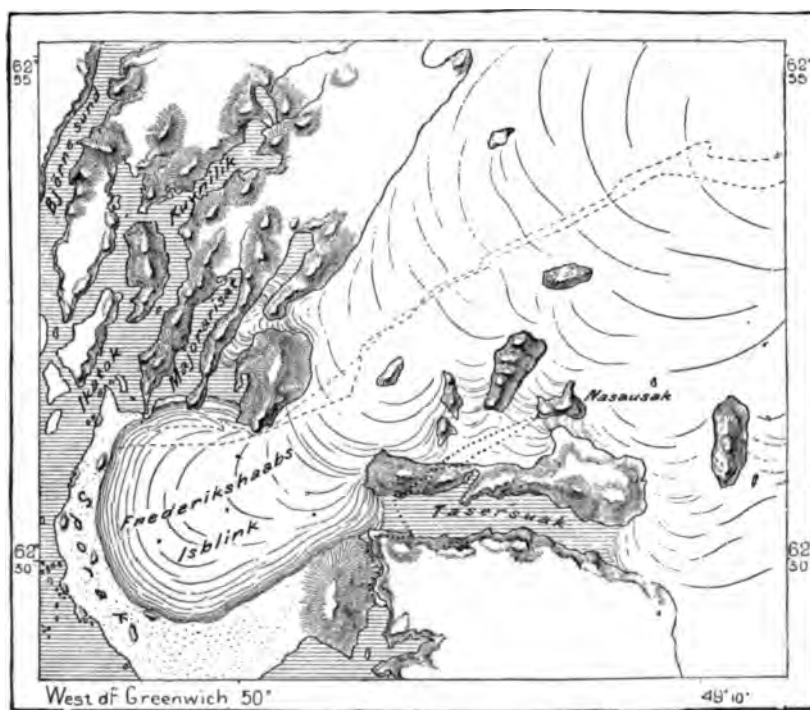


GLACIERS AND ICEBERGS.

Although so little is known of the interior the relative size and importance of the catchment basins is revealed by the lower extremities of the frozen streams. Towards the north the east side facing Europe seems to be less rich than the west in glaciers overflowing seawards. But the south-east coast is fringed, according to Garde, by over 170 glaciers following north and south in a space of about 200 miles. More than half of these are fed by the inland snow-fields, and more than a third are over 5,000 feet broad at their entrance into the Atlantic. On the

Fig. 24.—FREDERIKSHAABS ISBLINK.

Scale 1 : 700,000.



----- Itinerary of Jensen.
 Itinerary of Dalager.

18 Miles.

opposite or west side the glaciers are relatively much narrower. Such is the Sermitsialik, which discharges into a fjord 1,600 feet deep.

The space on the west coast comprised between 62° and 68° 30' north latitude is less encumbered with ice than any other part of Greenland, although even here several glaciers are of vast size. Such is the Frederikshaabs Isblink, which winds through a valley 26 miles long and no less than 9 miles wide at its outlet. But these frozen streams fail to reach the sea, thus leaving the coastlands free from ice for a distance of about 450 miles going northwards. In some districts the reindeer hunters advance 90 miles from the seaboard before reaching the edge of



VIEW TAKEN ON THE SERMITSIALIK GLACIER, NEAR IVIGTUT, GREENLAND.

T. TAYLOR



the inland ice-cap. The superficial area of the iceless zone may be estimated altogether at over 20,000 square miles. In general aspect it differs little from the Norwegian seaboard lying under the same latitude, being similarly indented with numerous fjords ramifying in various directions, though for the most part disposed at right angles with the coast. At the upper end of these long marine inlets the alluvial tracts are watered by brooks and even rivers, which, like those of the Alps, flow in summer through terminal arches at the foot of the glaciers. These temporary streams are the most copious in the whole of Greenland, yet they represent only a part of the excess of annual moisture precipitated under the form of rain or snow, for much of this moisture is also returned to the ocean through the huge icebergs continually breaking away seawards.

The long convoys of these icebergs, which drift southwards and imperil the navigation of the north Atlantic, originate on the west coast of Greenland, between $68^{\circ} 30'$ and 75° north latitude. One of the great sources of supply is the Jakobshavn glacier, which discharges into Disko Bay at a point where its bed is contracted between two lofty headlands. Still more voluminous is the Torsukatak glacier, which presents a frontal wall nearly 5 miles long, and which reaches the coast at Waigat Strait, north of Disko Bay. Then follow other frozen streams in the fjords along the seaboard beyond the Narsok (Narsuak) peninsula as far as Upernivik Bay, whose glacier at its mouth is divided into several branches by a cluster of high islets, giving it the aspect of a cataract disposed in numerous divisions by rocky piles.

North of this point the glaciers have been little studied; they are seen to disembody between most of the headlands, although explorers do not describe them as giving rise to any large icebergs. Even the enormous Humboldt glacier, which develops a concave frontal wall over 60 miles long and 300 feet high above the unfathomed depths of the Kane Basin, cannot be compared to those of Danish Greenland for the number and size of its crystal fragments.

Most of the glaciers reaching the coast round the Greenland seaboard present a somewhat regular frontal line, from which blocks of varying size break off with every wave and drift away with the current. But the frozen streams which yield those huge masses large enough to be called icebergs, that is, "mountains of ice," are relatively few in number, their production requiring a combination of favourable circumstances, such as the thickness of the parent glacier, the form of its bed, the depth of the water at its mouth. The larger fragments originate for the most part along that remarkable break which is presented in the normal formation of the coastline between Egedesminde and the Svartenhuk peninsula. Rink enumerates not more than thirty Greenland glaciers which discharge really large icebergs, and of this number only six or eight yield blocks of the first magnitude.

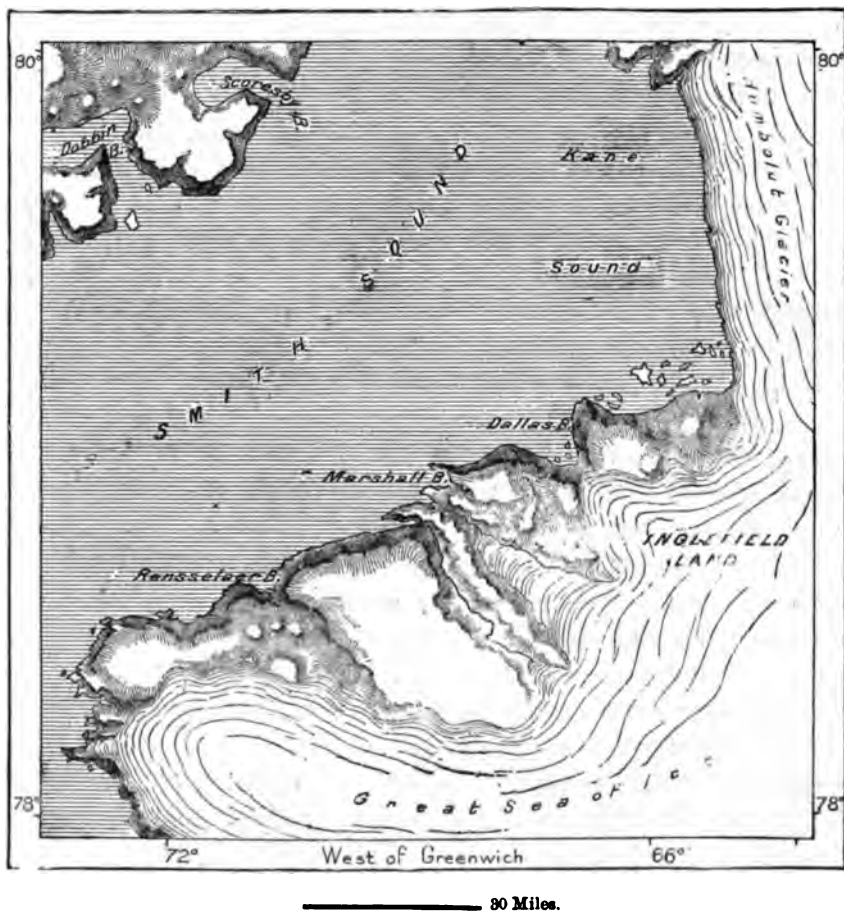
The average velocity of the congealed masses is about 50 feet in the twenty-four hours, but in some places a much greater speed has been recorded, though still varying considerably with the seasons. A branch of the Augpadlartok glacier north of Upernivik, moves at the rate of 100 feet a day, the highest yet measured. But how enormous must be the pressure of the inland icefields to

discharge into the sea the vast quantities of icebergs which are yearly sent adrift along the Greenland seaboard! Estimated in a single block the annual discharge from each of the five best-known glaciers would represent a mass of about seventeen billion cubic feet in capacity, and 5,600 feet in height, depth, and thickness. Reduced to a liquid state this mass would be equivalent to a stream discharging seawards 500 cubic feet per second, or 15,500 millions a year.

Each glacial basin may be compared to a fluvial basin defined by waterpartings

Fig. 25.—HUMBOLDT GLACIER.

Scale 1 : 2,500,000.

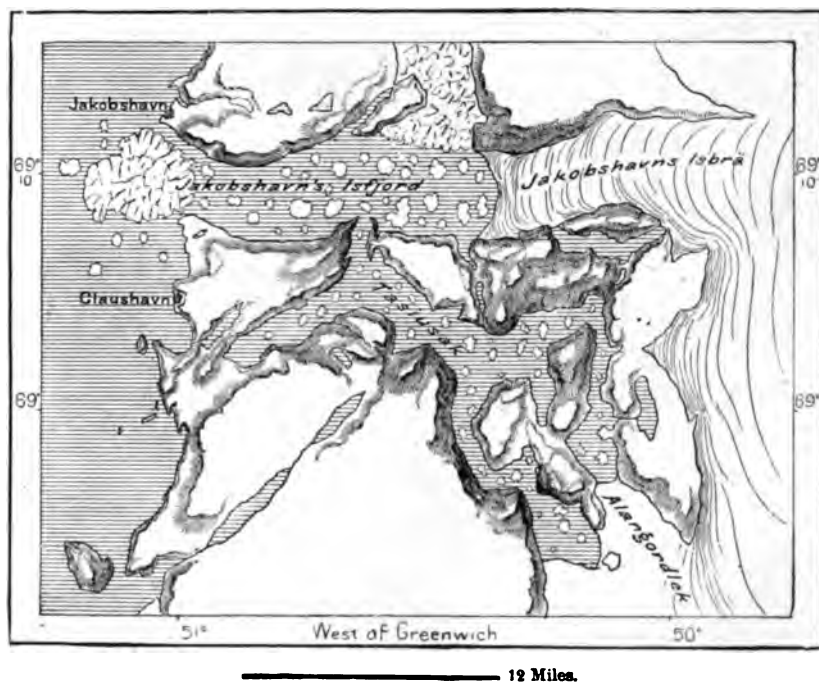


and ramifying into lateral basins. Like an ordinary river, it has its alluvial deposits, the fine particles of triturated rocks ground down by the friction of the slowly moving frozen streams. Nevertheless, most of the precipitated moisture probably returns to the sea in a liquid state. Estimating at twelve inches the annual snow and rain-fall of Greenland, Rink calculates that a sixth part is discharged in the form of ice, and five-sixths by evaporation and the streams fed by the glaciers. But the alluvial matter is mainly carried off by the running waters, very little sediment of any kind being transported by the drift ice.

The formation of this drift ice, or floating icebergs, is one of those phenomena which were discussed long before the seaboard had been studied, or before the breaking away of the frozen masses had actually been witnessed. Wherever the glaciers discharge through a broad valley preserving a uniform width and depth for a considerable space, and advancing seawards through a fjord of like dimensions, and with gently sloping bed, the ice may progress without any of those accidents caused by the inequalities of more rugged channels. Under such conditions the compact mass glides smoothly forward over its rocky bed without developing any rents or fissures. But as it moves down like a ship on its keel, it tends to rise, being at least one-twentieth lighter than the displaced water. It is

Fig. 26.—JAKOBSHAVN GLACIER.

Scale 1 : 600,000.



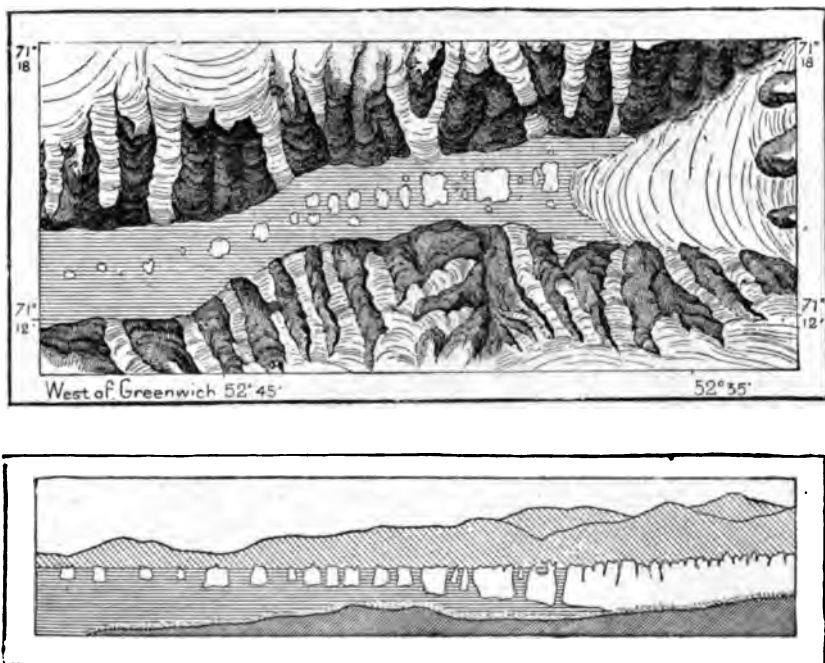
also left without support by the sudden fall of its bed beyond the normal coast-line. Nevertheless, it still continues its onward movement through the waters to a point where its weight prevails over its force of cohesion with the frozen stream thrusting it forward. At this point it snaps off suddenly with a tremendous crash, and the iceberg, enveloped in a thousand fragments projected into space, plunges into the abyss and whirls round and round to find its centre of gravity amid the troubled waters. On recovering from the bewilderment caused by all this tumult and chaos, the spectator finds that the glacier has apparently receded a long way towards the head of the bay, in the middle of which a crystal peak is seen slowly drifting away with the current. In this he recognises the huge

fragment detached from the glacier, though seldom able to detect its primitive form, the greater part, say at least six-sevenths of its volume, sinking below the surface. In the Jakobshavn Fjord Helland observed several icebergs rising 300 feet above sea-level; one even attained a height of 400 feet and was some miles long on all sides. But being too large to cross the sill at the entrance of the fjord, these enormous masses run aground at the bar, where they break into several fragments still of great size. The highest measured by Nares in the open seas rose 250 feet above the surface, and in the Denmark Channel, between Greenland and Iceland, Garde saw none exceeding 200 feet.

It is easy to understand how dangerous to shipping must be the proximity of

Fig. 27.—MOVEMENT OF THE KANGERDLUG-SUAK GLACIER, UMANAK DISTRICT.

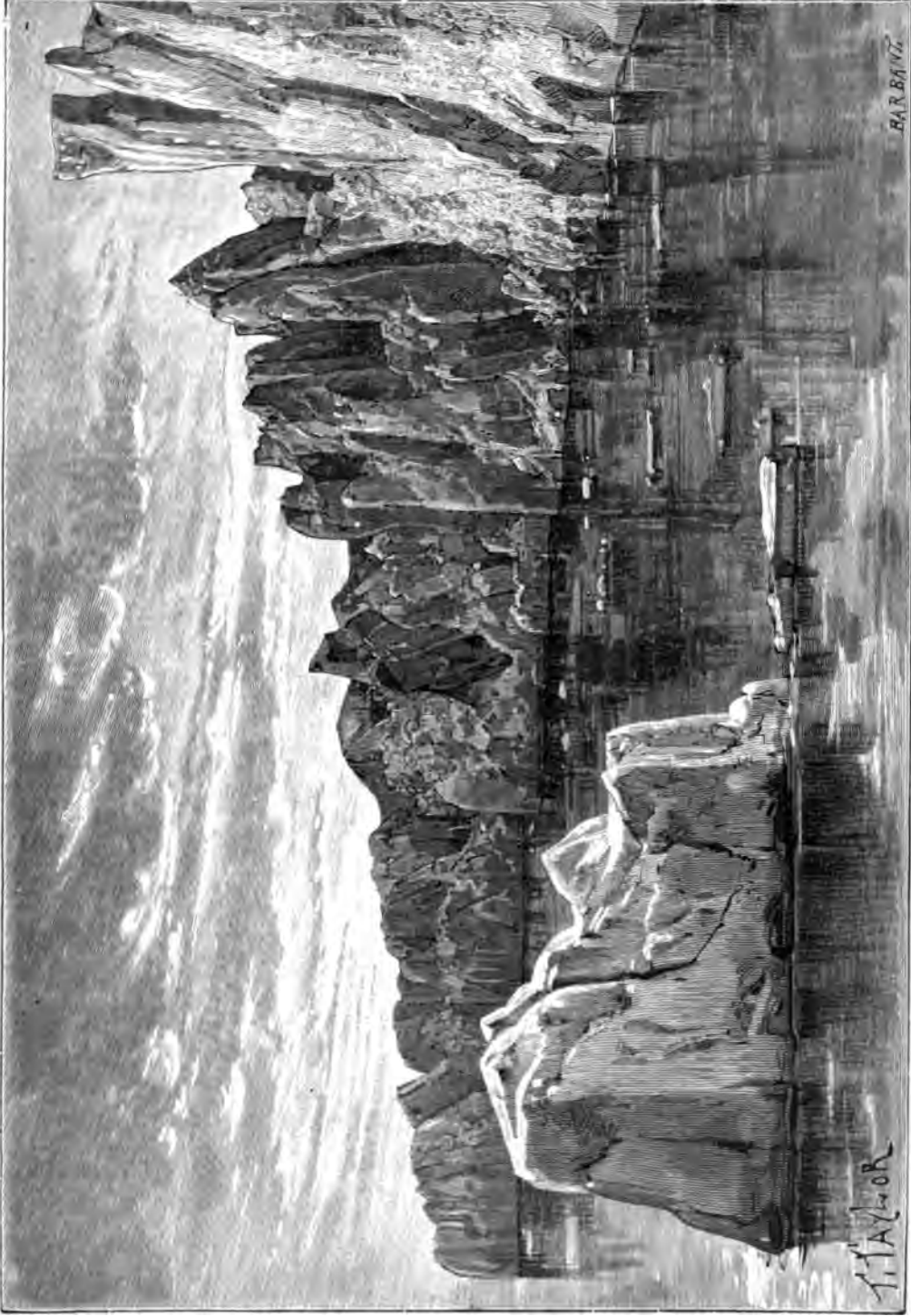
Scale 1 : 300,000.



The scale of heights is 50 times greater than that of lengths.

those glaciers which suddenly throw off such prodigious masses, whose capacity is measured in hundreds of millions, and even billions of cubic yards. The instantaneous crash churns up the seething waters, and in many places changes the marine level by many feet, causing sudden eddies, swift currents, and even rapids like those of a river. Then the tumultuous waters rush fiercely through the narrows, sweeping along the broken fragments of ice, and threatening vessels in port with imminent destruction.

During the present geological epoch, some glaciers have been retreating, while others, such as the Sermitsialik, have advanced several miles. But it is difficult



FRONT OF THE SERMITSIALIK GLACIER.



to say whether the inland ice has, on the whole, increased or diminished. When compared, however, with a still more remote period the present aspect of the seaboard, especially in the inhabited regions, attests a retreat of the present glaciers. The coastlands now free from ice were formerly icebound like the interior, and the peninsulas and islands fringing the shore were connected with the mainland by continuous glacial fetters, as shown by the erratic boulders, and the polished surface of the rocks. Since the retreat of those glaciers, that no longer reach the coast, deposits of sand and mud have been formed in the abandoned beds, and these deposits have even encroached on the fjords themselves. At the entrance of the inlets a submarine ridge of *débris* marks the limit between the outer and inner waters. This *skargard*, as it is called, represents the frontal moraine of the glacier which formerly filled the whole fjord, and which has gradually receded inland. Thus Disko Bay was at one time entirely occupied by the Jacobshavn glacier, while that of Torsukatak overflowed beyond Waigat Bay, strewing erratic blocks of gneiss over the basalt banks of its bed. Greenland has consequently entered a period of higher temperature; its glaciers have diminished in size, and the fjords formerly filled with ice have become open marine inlets.

UPHEAVAL AND SUBSIDENCE.

Most geologists also believe that considerable changes of level have taken place along the coastlands, as shown by the raised beaches occurring at various heights above the present sea-level. Some are mentioned by Hammer and Steenstrup as high as 480 feet, and the same observers have also found banks of marine shells belonging to the present fauna at an elevation of 190 feet. Nevertheless these terraces and deposits are no absolute proof of upheaval, as their formation may be explained by the former extension of the glaciers. When these frozen streams advance seawards far enough to close the entrance of a lateral fjord, its communication with the sea is cut off and it becomes transformed to a lake, whose level is gradually raised until the overflow finds an outlet through some sill or crevasse. In this way lakes have been formed to the right and left of the glaciers, rising to various altitudes and carving on the surrounding cliffs regular beaches like those skirting the seashore. Then as the confining glacial barrier subsides the lake is gradually lowered, and at last exhausted, leaving on the flanks of the encircling hills the traces of its former presence.

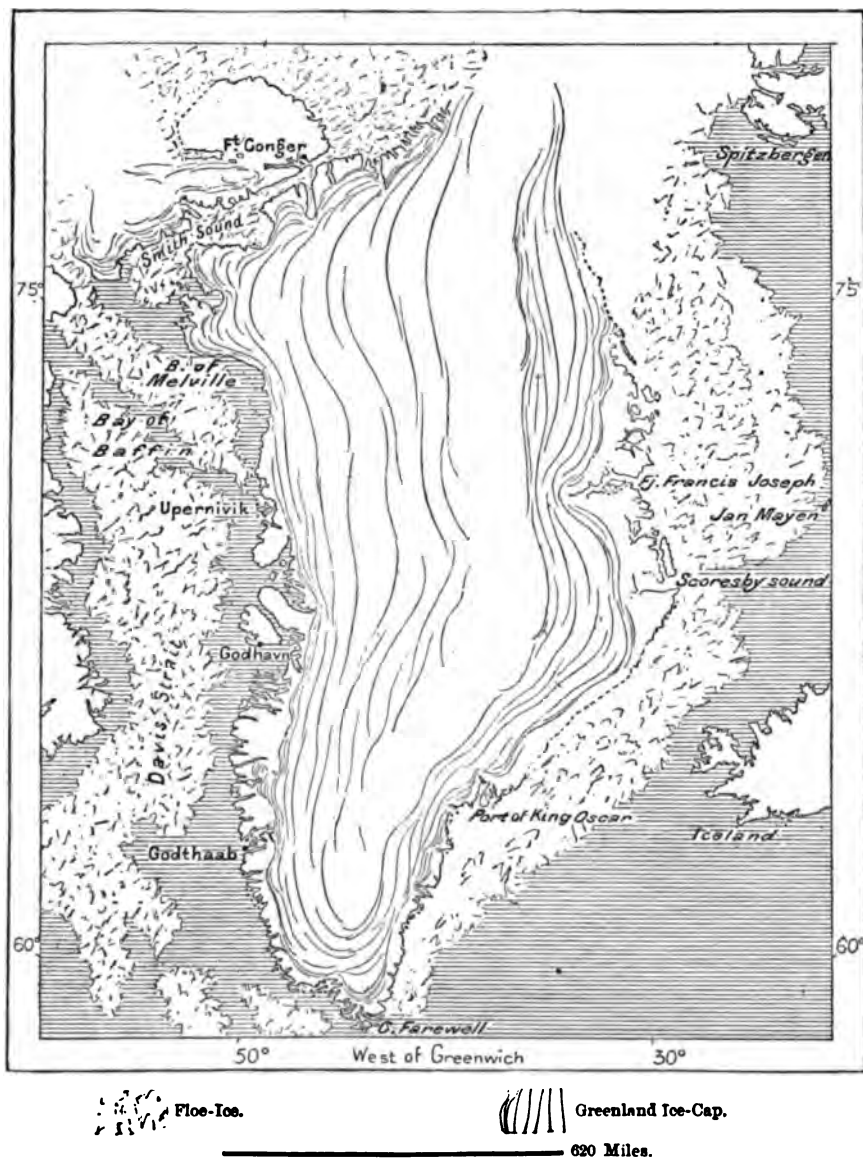
On the Greenland coastlands hundreds of such lakes still exist; but there are also other lacustrine basins which were evidently marine inlets, and which now stand above the level of the sea without having been separated from it by glacial action. Hence their origin can be explained only by the assumption of a change in the relative levels of land and water. Such is the lake discovered by Kane to the north of the Humboldt Glacier, some 30 feet higher than the spring tides. Its water has gradually become fresh, but its fauna remains marine, so that there can scarcely be any doubt it at one time formed part of the neighbouring gulf. Round about Polaris Bay, Hall visited several basins of a similar character, and up

to an altitude of 1,760 feet he observed beaches containing thick beds of driftwood and marine crustaceans.

Geologists generally suppose that the region of North Greenland has been upraised during the present epoch, whereas the coastlands south of 77° north

Fig. 28.—GREENLAND FLOE-ICE.

Scale 1 : 22,000,000.



latitude have undergone a movement of subsidence. Pringel, Kane, Payer and others, appeal to numerous instances of erosion and denudation, which they regard with the Eskimo as proofs of a general lowering of the land, whereas Steenstrup sees in all this nothing but local phenomena without any general significance.

MARINE CURRENTS AND TIDES.

The system of coast currents is difficult to explain in its details, owing to the contradictory reports of observers perplexed by the incessant struggles and shiftings caused by the conflicts between the tepid Atlantic and cold Arctic waters. Along the east side, which is occasionally connected by continuous floe-ice with Iceland and Jan Mayen, the current sets parallel with the shore from north to south and south-west; it consequently flows in an opposite direction to the branch of the Gulf Stream known as "Irminger's Current," which sweeps round the west and north sides of Iceland. But the soundings have revealed the fact that the polar current rests on a layer which itself belongs to the Gulf Stream, and which sets northwards while the surface waters move southwards. This is clearly shown by the temperature and salinity of the water, both increasing with the depth. From freezing point in the surface waters the heat increases as much as 10° and even 12° Fahrenheit lower down, and the salinity increases in the same direction from 30 to 35 thousandths and more.

About Cape Farewell the conflict of waters is shown by phenomena of a very irregular character. Sheets of ice are often seen drifting with a surface current in one direction, while large blocks, penetrating to lower depths, were carried in another by a contrary undercurrent. One of these blocks, which stranded in 1884 near Julianahaab, was found covered with refuse from the *Jeannette*, which had been icebound not far from one of the mouths of the Lena. The flotsam had thus taken three years to drift some 3,000 miles across the Arctic Ocean and round Greenland. From Polar Asia also comes the drift-wood, larch, alder, and the like, which is gathered on the east coast.

On the west side a relatively warm current sets northwards to Smith Sound, and probably continues in the same direction under the floe-ice, for such a current has often been reported in Kennedy Channel. It is owing to this warm current that the western parts of Greenland are still comprised in the habitable world. Here villages, surrounded by cultivated plots, have sprung up on the margin of the fjords: fishermen find an open sea in which to pursue their prey; skippers are able to coast the seaboard from port to port, whereas the central parts of Davis Strait and Baffin Bay are obstructed by large quantities of ice often forming a continuous mass, the *middle-pack* of English seafarers. At times the contrast of temperature between two neighbouring places is most surprising, especially near Smith Sound. Thus Whale Sound and Foulke Bay enjoy a remarkably mild climate compared to that of Rensselaer Bay, where Kane wintered, although it lies only some forty miles to the north-east. Hayes speaks of the former region as an "oasis" and a "Paradise;" in any case it is a land where the Eskimo can live and find sustenance.

According to some explorers all influence of the Gulf Stream ceases north of Baffin Bay.* The waters penetrating into the northern straits would appear usually to set from the Paleocrystic Sea, where are united the two tidal currents,

* Axel Hamberg, *Proc. of the Royal Geographical Society*, 1884.

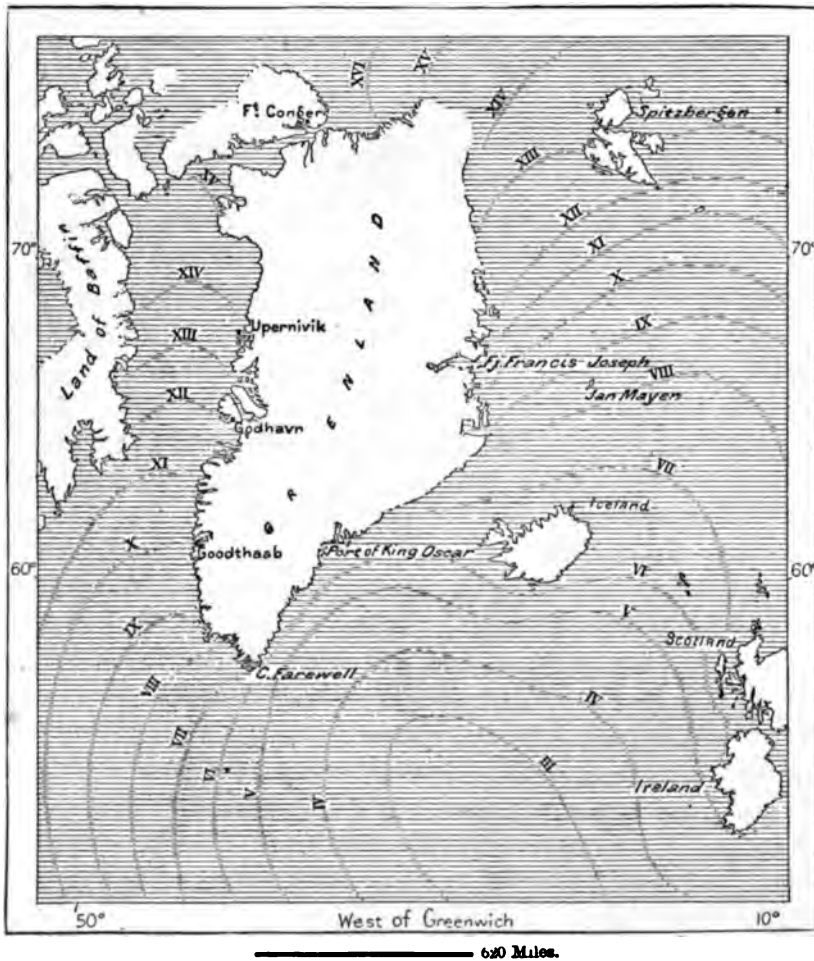
one coming from the Atlantic round the north of Ireland, the other from the Pacific through Bering Strait.

FOSSIL REMAINS.

If Greenland, like other regions, passed through a glacial epoch, the fossil remains preserved in its sedimentary rocks show that it had also its hot and tem-

Fig. 29.—MOVEMENT OF THE TIDAL CURRENTS MOUND GREENLAND.

Scale 1 : 35 000 000.



perate periods. The old formations which have yielded carboniferous, triassic, and jurassic fossils, present types of organisms comparable to those at present found in the torrid zone. The upper chalk beds, abounding in vegetable forms, analogous to those of the subtropical and temperate zones, had already been examined by Giesecke at the beginning of this century. They supplied to Nordenskjöld a very remarkable flora, especially rich in dicotyledonous plants

represented by numerous families of Cycadea, a tree-fern and even a bread-fruit tree. At that time the mean temperature must have been as high as 68° Fahr.

The miocene flora, whose general physiognomy corresponds to a more temperate climate, averaging about 53° or 54° Fahr., is illustrated by splendid specimens discovered chiefly in Disko Island and the surrounding peninsulas. Quite a fossil forest is buried under the ferruginous mass of Mount Atanekerdluk, a peak which rises to a height of over a thousand feet over against Disko, and which is now surrounded by glaciers on all sides. From these deposits Whympcr, Nordenskjöld, and others have extracted 169 species of plants, of which about three-fourths were shrubs and trees, some with stems as thick as a man's body. Altogether there have been discovered in the Greenland strata as many as 613 species of fossil plants. The most prevalent tree is a sequoia, closely resembling the Oregon and Californian giants of the present epoch. Associated with this conifer were beeches, oaks, evergreen oaks, elms, hazelnuts, walnuts, magnolias, laurels; and these forest trees were festooned with the vine, ivy and other creepers. A leaf of a cycadea found amongst these fossil remains is the largest ever seen, and a true palm, the *flabellaria*, has been discovered amongst the remains of these old Arctic forests.

To develop such a flora the climate of North Greenland must at that time have been analogous to that at present enjoyed on the shores of Lake Geneva, twenty-four degrees nearer to the equator. According to the same gradation of temperature the dry lands about the north pole itself must at the same epoch have had their forests of aspens and conifers. According to Oswald Heer the change that has taken place in the climate since then represents a fall of 30° or 40° Fahr. for North Greenland. The interval between these two ages was marked by the glacial period, whose traces are visible on the west coast.

CLIMATE.

At present the climate of Greenland is one of the coldest in the world. The isothermal of zero traverses the land near its southern extremity, and in the northern districts whole years pass without a single summer's day, that is, with a temperature of 59° or 60° Fahr. At Upernivik the glass falls in winter to —47° Fahr., and even in summer it does not always rise to freezing-point. In September Nansen and his party had to endure colds of —56° Fahr. for several consecutive nights. On the other hand, the greatest summer heats scarcely exceed 64° Fahr. in the shade; but they amply suffice to melt all the snow on the plains and even on the hills of the coastlands.

In East Greenland the solar rays often appear unendurable to travellers, especially in virtue of the contrast with the ordinary low temperature. Payer relates that on the shores of the Franz-Joseph fjord the sailors, overcome by the heat, fell into a lethargic sleep from which it was difficult to rouse them. Scoresby saw the natives on the east coast walking about naked to cool themselves. In general the summer temperature is remarkably uniform throughout Greenland,

the few fine days of this season presenting a discrepancy of not more than 7° or 8° Fahr., as compared with differences of 20° or 25° recorded in winter. Towards the southern point the winter climate answers to that of Norway, while in the north it is quite Arctic.*

The prevailing sea breezes usually set north and south or south and north, the

Fig. 30.—DISKO ISLAND AND NURSOAK PENINSULA.
Scale 1 : 2,500,000.



former cold and dry, but occasionally accompanied by fogs in summer, the

* Temperature of various Greenland stations:—

	North Latitude.	Mean Temp.	Summer Temp.	Winter Temp.
Julianahaab . . .	60° 44' .	33° F. .	47° F. .	22° F.
Gorlthaab . . .	64° 8' .	29° .	42° .	17°
Jakobshavn . . .	69° 13' .	24° .	36° .	10°
Upernivik . . .	72° 48' .	15° .	38° .	6°
Sabine Island . . .	74° 32' .	13° .	55° .	—40°

latter humid, charged with rain or snow. By an apparent anomaly the warmest winds are those on the west coast, which come from the ice-covered inland plateaux. Rising in the tepid Norwegian waters these winds are cooled in their passage across the Greenland mountains, but again become warm as they approach the western seas. Their effect is felt in the north as well as in the south, raising the winter temperature at Upernivik above freezing point, and causing the snows to melt even in the month of January. They are frequently accompanied by heavy downpours, such as that of October, 1887, at Ivigtut near Cape Farewell, where the rainfall reached 8 inches in two days. In December the discharge exceeded 13 inches in eleven days, and the mean for the whole year rose to 46 inches. Farther north the rains are never so copious, and the climate beyond

Fig. 31.—FRANCIS JOSEPH FJORD.

Scale 1 : 2,500,000.



Upernivik may be described as very dry, as it also is on the east coast facing Iceland.

FLORA AND FAUNA.

Although incomparably poorer than that of miocene times, the present flora of Greenland is sufficient to clothe extensive tracts with a mantle of mosses, grasses, and brushwood. Wherever the snows melt under the influence of the sun or of the warm east winds, herbaceous and other lowly plants spring up even on the exposed *nunatak*, and to a height of 5,000 feet. Owing to the uniform intensity of the solar heat the summer flora is almost identical on the low-lying coastlands and highest mountain tops. True trees occur in the southern districts, where Egede was said to have measured some nearly 20 feet high. But the largest met by Rink during all his long ramblings was a white birch 14 feet high

growing amid the rocks near a Norse ruin. Few trees in fact exceed 5 or 6 feet, while most of the shrubs become trailing plants. Such are the service and alder, which on the coast reach 65° north latitude, the juniper, which advances to 67°, and the dwarf birch, which ranges beyond 72°.

In its general features the Greenland flora, comprising about 400 flowering plants and several hundred species of lichens, greatly resembles that of Scandinavia. Hooker and Dr. Robert Brown regard it as essentially the same as that of the North European highlands and lacustrine regions. Even on the west coast facing America this European physiognomy is said to prevail, although to a less degree than on the opposite side, which appears to be much poorer in vegetable forms. But though limited, the American element is important, supplying to the natives numerous edible berries, algæ, and fuci, which have saved whole tribes from starvation during periods of scarcity. The Europeans have also their little garden plots, where they grow lettuce, cabbage, turnips, and occasionally potatoes about the size of schoolboys' marbles.

Like the flora, the fauna is mainly European, resembling that of Iceland, Spitzbergen, Lapland, and Novaya Zemlya, with all which regions Greenland at one time formed continuous land. The mammals, such as the reindeer, white bear, Arctic fox and hare, ermine and lemming, are those of Europe, the musk ox alone being of American origin. But this animal is not found in the habitable parts, being confined to the glacial tracts limited westwards by Smith Sound, and ranging eastwards to Franz-Joseph Fjord. The Danes have introduced a few of their domestic animals, the dog, cat, ox, pig, sheep, and goat; but on the other hand their firearms have greatly diminished the primitive fauna. Herds of reindeer are no longer met in the northern parts beyond the European settlements, where as many as 25,000 were annually killed during the years 1845-49, and 8,500 from 1851 to 1855. The swan has also become rare; another bird, probably the auk (*alca impennis*), has completely disappeared, and the eider is now seen only in the small archipelagoes remote from the Danish villages. Beetles and mollusks are far less numerous than in Norway, from which Nordenskjöld infers that the glacial period has persisted much longer in Greenland than in Scandinavia.

The surrounding seas teem with animal life, comprising as many as seven species of seals and sixteen of cetaceans, besides fishes, mollusks, and smaller organisms in endless variety. The marine fauna presents a distinctly European character, and in its mollusks Davis Strait still forms part of Europe.

According to seafarers at least one-fourth of the West Greenland waters is diversely coloured dark brown, green, or milky white, these tints being due to the diatomaceæ filling these seas to a depth of 600 or 700 feet and for many thousands of square miles. Numerous species of medusæ feed in these vast "prairies," and in their turn fall a prey to the cetaceans. The neighbourhood of the coloured waters is always hailed as a good omen by the harpooners, who here secure rich harvests of seals, cetaceans, and fish. The seal is the chief resource of the Eskimo, who use the oil and fat as food, the sinews as a stout sewing thread, the

skins for the manufacture of garments, tents, and canoes. The walrus or morse is also hunted for the sake of its tusks, which yield a hard, white ivory more valuable than that of the elephant.

INHABITANTS.

The great bulk of the present population consists of Danes, Danish half-breeds, and the Eskimo proper, more or less modified by crossings with the early Norse settlers. Nearly all the inhabitants, already Christianised and civilised by the missionaries, are grouped in parishes, whose organization differs from corresponding European communities only in those conditions that are imposed by the climate and the struggle for existence. There still survive, however, a few tribes of pure Eskimo stock, such as those recently discovered by European explorers beyond the Danish territory north of Melville Bay and on the east coast. Others also may perhaps exist along the shores of unvisited or inaccessible fjords. But the most northern camping-ground hitherto discovered is that of Ita (Etah), situated in Port Foulke on Smith Sound, in $78^{\circ} 18'$ north latitude. In 1875 and again in 1881 it was found abandoned; but it is known to have been previously inhabited, and the natives had returned to the place in 1882 and 1883.* When visited by Hall and his party, this little group of twenty persons, who had never seen any other human beings, fancied that the strangers were ghosts, the souls of their forefathers descending from the moon or rising from the depths of the abyss. In their eyes the ships of John Ross were great birds with huge flapping wings.

The term "Eskimo" applied by Europeans to the natives of Greenland, the Arctic Archipelago and the Frozen Ocean, is usually interpreted by etymologists in the sense of "eaters of raw fish." This designation, which is of Algonquin origin, is supposed to have been given to the "Hyperboreans" by their Redskin neighbours proud of their superior civilization. But the Eskimo themselves, who from their isolated position had come to regard themselves as almost constituting the whole of mankind, called themselves in a general way by various names, amongst others that of Innuít or Inuit, that is, "men" in a pre-eminent sense. Karalit, another of these designations, appears to be the original form of the term "Skrällinger," applied by the early Norse invaders to the natives with whom from the first they had maintained a deadly struggle. The Europeans on the other hand are known to the Eskimo by the name of Kablunak, that is, the "Crowned," in allusion to their headdress.

The Greenland Innuits are all grouped along the coastlands, as are also their western congeners as well as the Asiatic Chukches, who probably belong to the same stock. They are prevented by the ice-cap from penetrating far inland, while fishing, their chief pursuit, obliges them to settle along the shores of the fjords and headlands. It has thus been easy to calculate their numbers in those districts where Europeans dwell amongst them. In the whole of North America they are estimated at about 30,000 altogether, while those of Greenland rather exceed 10,000, all but 500 or 600 confined to the west coast. In certain districts

* Greely, *Three Years of Arctic Service*.

their groups of habitations are dispersed over large spaces, the stations being sometimes over 60 miles apart, and quite inaccessible one to the other except by way of the sea.

Despite the vast extent of their domain, stretching 3,000 or 4,000 miles from east to west between the Pacific and North Atlantic Oceans, the different tribes everywhere present great uniformity in their appearance, customs, and idioms. Like other American languages the Eskimo is of polysynthetic form, the same structure and the same roots prevailing from Bering Strait to Labrador. Of all the dialects the most divergent is that of the few inhabitants of East Greenland, a fact due either to their long isolation, or else to the custom of scrupulously avoiding all combinations of syllables that might recall the names of the departed. Every death thus contributes to modify the current speech.

The striking analogy in their customs presented by the hyperborean Eskimo and the troglodytes of the stone age in West Europe has suggested the theory of a relationship between the two groups of populations. The peoples who occupied the Dordogne basin when its climate resembled that now prevailing in the polar regions, are supposed to have gradually retired northwards with the increase of temperature. Following the retreat of the snows and of the animals inured to an Arctic climate, they thus at last reached the polar circle and became the ancestors of the present Innuits. Rink, however, who has dwelt longest amongst the Greenlanders, does not consider this theory justified. According to him the Eskimo are pure Americans, who while contrasting in appearance with their immediate neighbours in the British possessions, nevertheless present every shade of transition to the American type through their congeners of Alaska, the Charlotte Islands, and British Columbia.*

Amongst the Greenland Eskimo are most frequently found men of average and even high stature, especially on the east coast. Most of those on the west side are short, but thickset and robust, with short legs, small hands, and a yellowish-white complexion. The face is broad and flat, the nose very small, the eyes brown and slightly oblique like the Chinese, the hair black, lank and falling over the forehead, the expression mild, suggesting that of the seal, the animal which is ever in their thoughts, and whose death is their life. They have also the seal's gait and carriage, as well as the rounded figure well lined with fat to protect it from the cold. What essentially distinguishes the Eskimo from the Mongolian, with whom he was till recently affiliated, is the extremely "dolichocephalous" form of his head, the skull, with its vertical sides and sharp crest, often affecting a "scaphocephalous" or boat-like shape. According to Dall the cranial capacity is higher than that of the Redskins.

Both sexes are dressed very much alike. European fashions, however, have already penetrated amongst the Greenlanders, and in many districts, men are now met wearing the garb of European labourers, while the women deck themselves with cotton stuffs and many-coloured ribbons. But in winter no costume could advantageously replace their capacious boots, sealskin pantaloons, close-

* H. Rink, *The Eskimo Tribes*.

fitting jacket, and the *amaut*, or hood which "keeps baby warm." In Danish Greenland the women no longer tattoo their chin, cheeks, hands, or feet, nor do they now insert variegated threads under the skin, the missionaries having interdicted these "pagan" practices. Singing, dancing, the relation of the old legends, even athletic games amongst the young people were also formerly sternly repressed. Indulgence in strong drinks is allowed only once a year, on the anniversary of the King of Denmark, and the royal monopoly of the trade with Greenland is justified on the ground that in this way the importation of spirits is prevented.

At present all the Eskimo of the Danish territory are Protestants. Hans Egede, their first missionary, landed in 1721 on the spot where now stands the station of Godthaab. He was followed twelve years later by the Moravian Brothers, who founded their "sheepfold" in the same district, but who had long to wait for the flock. Aiming at a complete revolution in Eskimo society, these foreign "magicians" had constantly to contend with the *angakok*, or native wizards, whom they endeavoured not only to deprive of all religious prestige, but also to set aside as civil counsellors and magistrates. With the conversion of the natives complete submission was secured, the only troubles that have since arisen being caused by the excessive zeal of the neophytes, who aspired to the rôle of prophets and founders of new sects.

On the west coast no trace survives of the old heathendom except the name of the supreme god, Tornarsuk, which has been adopted as that of the devil, while the *bugakak*, or good spirits of old, have now become the demons of the lower regions. For over a century Greenland parents have ceased to place a dog's head near the graves of departed infants, "so that the soul of the dog, which finds its way everywhere, may lead the child to the land of spirits." In East Greenland the bodies of the dead are thrown into the sea, except in times of epidemics, when the survivors shift their quarters and leave the corpses in the abandoned huts. Carved wooden figures, recalling the "genealogical trees" of the South Alaskan islanders, still adorn the entrance of the houses in the northernmost villages on the Atlantic coast. In their hunting expeditions these villagers often see phantoms gliding over the heights; these are the ghosts of the departed returning to scare the living.

Their conversion to Christianity has scarcely bettered the material condition of the Greenlanders. The hovels, constructed of alternate layers of stone, earth, and turf, and roofed with earth supported by a little driftwood, are small and gloomy, and often give way. Being mostly destitute of stoves or hearths, they can be heated only by the lamp, the "soul of the dwelling" during the long winter months. Escaping at last with the warm season from these foul dens, the inmates remove the roofs to let wind and rain cleanse their abodes, and meantime pitch their tents in some more healthy spot. On the east coast every community consists of a single house, harbouring on an average ten families, or about fifty persons. Here fire is still procured by the primitive method of rubbing two bits of wood together.

In all Greenland there are scarcely fifty head of cattle; sheep, goats, and even

poultry are also rarely met, jealously guarded in the enclosures of a few wealthy Europeans. The only domestic animal of real value is the dog, a savage beast of uncertain temper, often tortured by hunger, and now threatened with extinction. The question arises, how the natives themselves can hope to survive when deprived of the animal that now conveys them from fjord to fjord and transports the produce of the fisheries to their settlements? In 1877 there were still 1,800 dogs and 320 sledges in all Greenland, and it has been proposed to replace the dog by the reindeer. But the natives have not yet learnt to tame this animal, which has moreover become very rare in the neighbourhood of the Danish settlements. The only remedy seems to be the introduction of the Lapps with their domestic herds.

The Greenlanders have two kinds of boats, the *kayak*, used for fishing, and the *umiak* for transport. Although the word *kayak*, borrowed from the Tatars of Siberia, has made the round of the globe from the *caïque* of Constantinople to the West Indian *cayuco*, the Greenland boat is peculiar to the Eskimo world. Formed of sealskins stretched on a frame 16 to 20 feet long, and 2 feet wide, it presents only one narrow opening, into which the native introduces himself enveloped in a cloak which is sewed to the boat. Provided with a double paddle he glides over the waves almost as swiftly as the seal itself, a good boatman averaging 80 miles a day. If it capsizes a single stroke of the paddle suffices to right the craft, which weighs only 55 or 60 pounds, and may easily be transported overland. The *umiak*, or "women's boat," so called because usually propelled by women, is also made of sealskins stretched on a frame, but is flat-bottomed and large enough to carry as much as three tons of merchandise. Collision with a block of ice would suffice to sink it, so that it has to be managed with great care, the crew seldom venturing beyond the line of breakers into the high sea.

If the produce of the chase and fisheries could be uniformly distributed from season to season, it might perhaps suffice for the wants of these scattered communities. But the communications are so difficult that times of plenty are often followed by long periods of scarcity. The old cannibal practices no longer exist; infanticide is rare; the aged and sick no longer invite their friends to despatch them. But the same work of destruction is continued by famine and misery. About 8 per cent. of the deaths are those of men drowned in their kayaks. The consequence is a considerable disparity of the sexes, the women outnumbering the men in the proportion of about 115 to 100.

All writers on the subject consider that the Greenland natives are dying out. According to Egede there were as many as thirty thousand on the west coast at the beginning of the last century; but so rapid was the decrease that a hundred years later Graah estimated the whole population in the Danish region at a little over six thousand. Since then, however, there has been a slight increase, and at present it is about stationary between nine thousand five hundred and ten thousand. But this is mainly due to crossings, which give a more vigorous offspring than that of the pure race. Immigration also contributes to maintain the

equilibrium, the wild tribes of the east coast being continually attracted to the European settlements.

Possessing great natural intelligence combined with love of instruction, the Greenlanders may justly claim to be civilised. The great majority read and write their mother tongue, and sing European melodies, while several speak English or Danish. Nearly all the families have their little library, and read their Eskimo newspaper, as well as the collections of national legends, illustrated with

Fig. 32.—GREENLAND ESKIMO.



engravings by native artists. Greenland even possesses at least one original work, the account of the voyages of Hans Hendrik, companion of Kane, Hall, Hayes and Nares.

Formerly, the right of property was restricted to objects of personal use, such as clothes and weapons; the hunting grounds belonged to the whole community, and the produce of the chase or fisheries was equally distributed amongst all. The rights of communal property were also regulated and safeguarded by general assemblies followed by public banquets. But the Europeans have changed all that by introducing the principle of sale and purchase, by enlarging to their own profit the rights of personal ownership, and proclaiming the new gospel of "every man for himself." The result is a general impoverishment and moral degradation of the people. They are no longer like the Eskimo visited by Graah

on the east coast: "the gentlest, the most upright and virtuous of men." Nevertheless, the language possesses not a single abusive term, and it is impossible to swear in Eskimo.

TOPOGRAPHY.

The part of Greenland where Eric the Red built his stronghold, and where the banished Norsemen flocked around him, is still one of the least deserted regions, as it also is the most fertile and temperate. *Julianahaab*, capital of this district, contains one-fourth of the entire population of the country grouped on the banks of a small stream in a grassy valley near a deep fjord, which is unfortunately not easily accessible to shipping. Navigation is obstructed by the numerous icebergs drifting with the polar current across the entrance, and skippers have to make a long détour to the north in order to reach the anchorage off *Julianahaab*. As many as a hundred Norse, or other ruins, are scattered over the district, and at the very extremity of the fjord are shown the remains of the structures attributed to the first conqueror of Greenland. There are also some débris of old buildings on the terminal islet of Cape Farewell itself; but at present the southernmost group of habitations is the Moravian missionary station of *Frederiksdal*, the point first reached by the Eskimo immigrants from the east coast. Here the inland icefield, pent up between two mountains, is only a few miles broad; the passage from one slope to the other presents little difficulty, and is occasionally utilised by the white bear.

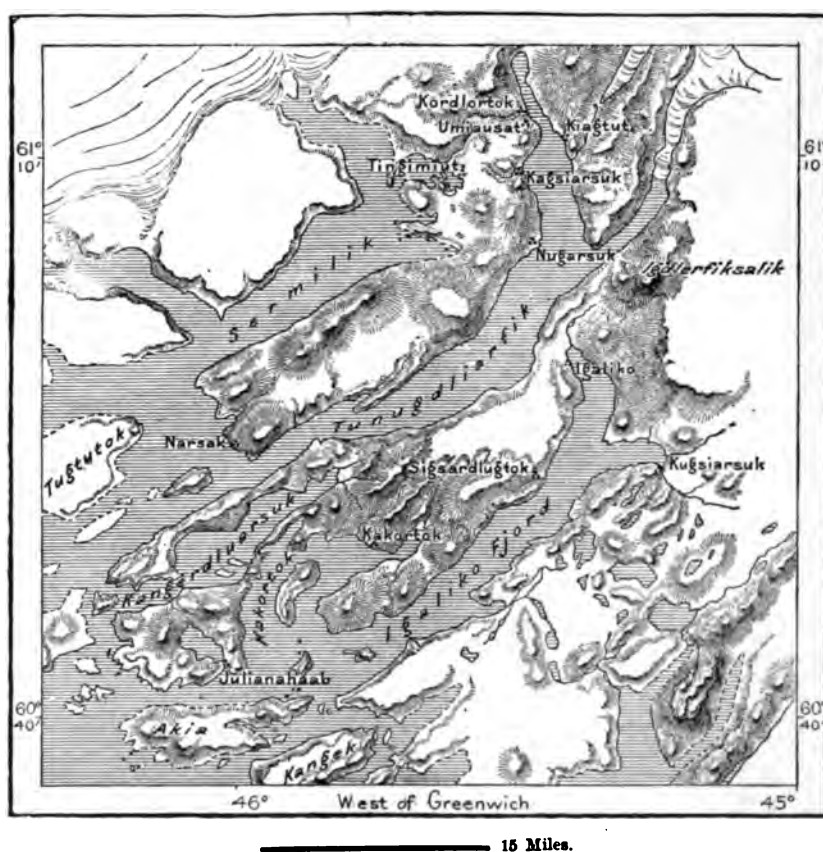
The *Frederikshaab* district, which follows that of *Julianahaab* in the direction of the north, is limited by branches of the ice-cap covering the whole of the interior. Southwards the glaciers reach the coast near the rugged insular heights of Cape Desolation; in the north is visible the enormous *isblink* of *Frederikshaab*, the bluish glint of its crystal surface reflected on the grey sky. The village, whence the district takes its name, has the advantage of an excellent harbour, sheltered by islands, but encircled by rocks and morasses. On this coast the most important station is *Ivigtut*, or *Ivigtok*, which has become famous for its absolutely unique deposits of cryolite. This mineral, of a whitish colour, was long known to the Greenlanders, and had been described by European mineralogists; but it was first utilised in 1856 by Sainte-Claire Deville for the preparation of aluminium. At present it is chiefly valuable for the soda and salts of alum used in dyeing, which are extracted from it. The natives reduce it to powder, which they mix with their tobacco to increase its strength. The *Ivigtut* deposits have been granted to a private company, in return for a yearly sum paid to the Danish Government. The beds, which are not very extensive, lie at the base of a precipitous rock on the seashore, so that vessels are able to ship their cargoes on the spot. It might also be possible to work the numerous beds of asbestos, as well as the eudialyte of *Julianahaab*, a substance which supplies the best burners for electric lights.

In any other region *Godthaab* would be an admirable trading centre, thanks to the labyrinth of fjords which here penetrate far into the interior. But this is

one of the least populous districts of Danish Greenland, nearly the whole traffic in seal and reindeer skins, cod and eiderdown being arrested either by the destruction of the animals or the want of capital. Yet it was formerly the richest and most commercial district in the whole country. Here Egede and the Moravian missionaries founded their first stations, and Godthaab is still the literary centre of Greenland, for it possesses both the seminary and printing establishment. A more flourishing place is the northern village of *Sukkertoppen*, or "Sugarloaf," so

Fig. 33.—JULIANAHAB AND ITS FJORDS.

Scale 1 : 750,000.



named from the conical shape of its island. *Sukkertoppen* is the most populous place in Greenland, and several of its three hundred and sixty inhabitants have learnt to build vessels of European form for the cod fisheries.

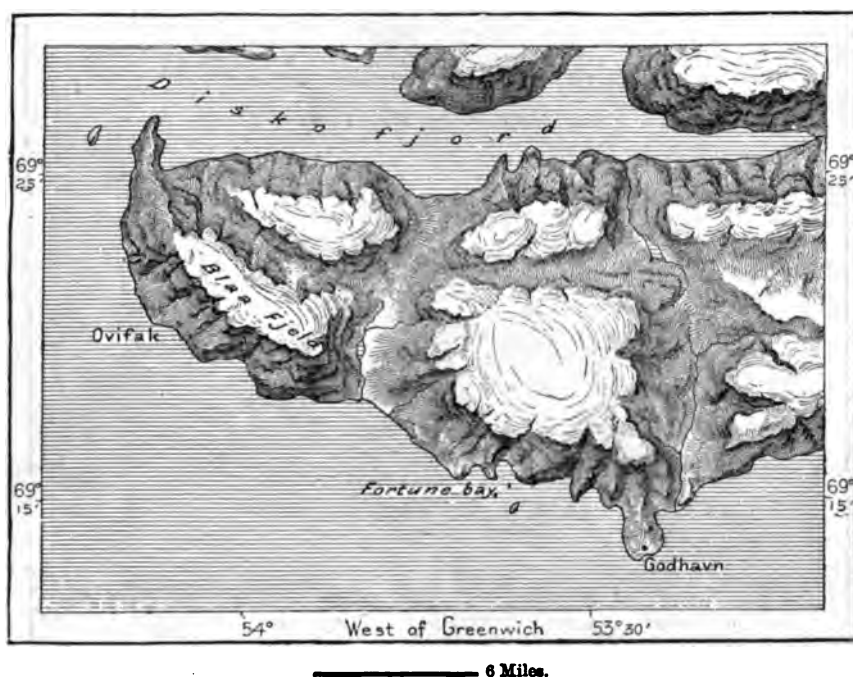
Other less important villages follow in the direction of the north. Such are *Holstenberg*, formerly a centre of the whale fisheries; *Egedesminde*, situated on an islet at the entrance of the spacious Disko Bay; *Kristianshaab*, standing on the mainland east of the same bay; *Jakobshavn*, at the entrance of a fjord which receives the most famous glacier in Greenland. This glacier, which discharges

the largest icebergs, is at present moving forward, its frontal wall having advanced nearly two miles seawards since it was visited by Hammer in 1878.

The port of *Godhavn*, till recently known to the whalers by the name of *Lively*, lies under shelter of a headland on the south side of Disko Island. It is the most frequented island in Greenland, being visited by most whalers and explorers during the six months of navigation. According to an Eskimo legend, here was made fast the rope by which an ancient magician drew the island of Disko away from the mainland. The local gardens, being well exposed to the southern sun, are renowned for their fertility throughout Greenland. The Waigat Channel, passing north of Disko Island and separating it from the hilly peninsula of

Fig. 34.—GODHAVN AND DISKO FJORD.

Scale 1 : 400,000.



Nursoak, leads to the little harbour of *Ritenbenk*, beyond which to the north lies the insular village of *Umanak*, a busy centre of the seal fishery. The graphite discovered in the Nursoak cliffs has no commercial value.

Upernivik (*Upernavik*) and *Tasiusak*, lying still farther north in $73^{\circ} 24'$ north latitude, are the last European settlements in Greenland, gloomy abodes lost amid the snows at the foot of yellowish or brick-red rocks. In winter the sun sets for eighty days, yet by a sort of mockery this glacial district bears an Eskimo name meaning "spring." The horrors of war were extended to this extremity of the habitable world at the beginning of the present century, when Upernivik was burnt by the English whalers, and all communication between Greenland and Denmark interrupted for the seven years from 1807 to 1814.



GENERAL VIEW OF UPERNIVIK.

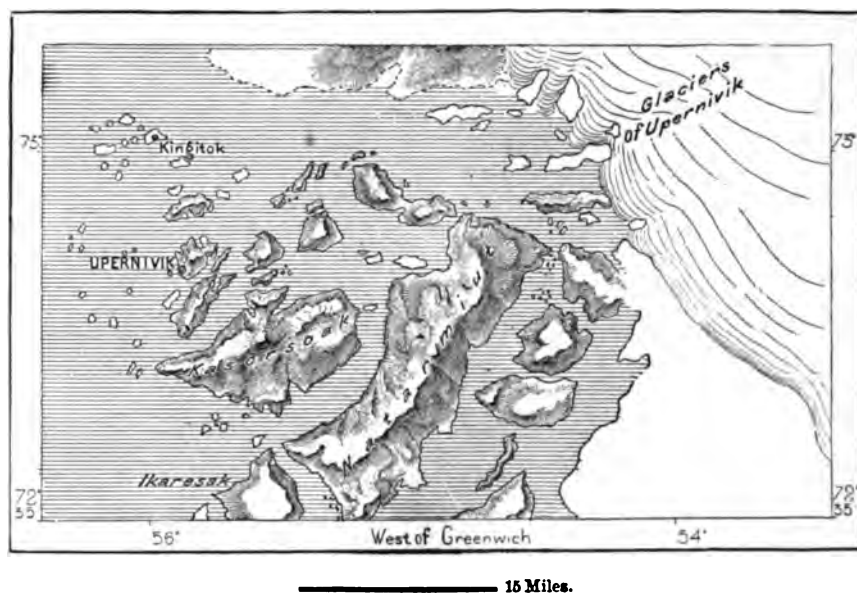


ADMINISTRATION.

Officially the whole of Greenland belongs to Denmark, but the actual Danish territory comprises only the inhabited part of the west coast between Cape Farewell and Tasiusak. Besides the two "governors" of North and South Greenland, the commercial agents settled in all the stations along the seaboard are representatives of authority amongst the natives, and depend themselves directly on the Board of Trade at Copenhagen. The Lutheran missionaries are also included in the number of official functionaries, being appointed by the Minister of Public Instruction and administering their parishes without being subject to the control of the civil governors. Lastly the Moravian missionaries, although without official

Fig. 35.—UPERNIVIK, ITS ISLES AND GLACIERS.

Scale 1 : 950,000.



status, also enjoy considerable influence, being at once the mayors and magistrates of the communities grouped around their stations and comprising one-fifth of the whole population.

Three physicians named by the Danish Government are charged with the sanitary inspection of the coastlands, that is, of a tract over 950 miles long. Each commune is now constituted in a municipality, whose council forms a tribunal for adjusting differences, imposing fines and in serious cases sentencing to the bastinado.

Since 1774 the Greenland trade is an absolute monopoly of the Danish Government, which maintains along the coast some sixty factories where European wares are given in exchange for such local produce as sealskins and train oil, eiderdown, feathers, walrus ivory, fox, bear, and reindeer peltry. The annual value of this

traffic is estimated at about £60,000. Notwithstanding the dangerous character of the navigation between Denmark and Greenland caused by the fogs and icebergs, the "royal" traffic lost only three ships between 1817 and 1862. The vessels engaged in this traffic are very solidly built and commanded by skilled captains familiar with the route. The postal service along the coast is entrusted to Eskimo sailors who travel in kayaks and sledges and rarely meet with an accident.

In the Appendix is given a table of the two provinces with their administrative subdivisions.





CHAPTER III.

THE ARCTIC ARCHIPELAGO.

THE numerous islands which continue the American continent in the direction of the pole, and which are nearly all comprised within the Arctic Circle, still remain somewhat vaguely defined along a great part of their periphery. Many promontories now figuring on the maps will doubtless prove to be distinct insular bodies, fjords and inlets will be transformed to straits, lands severed by imaginary channels will be merged in one; others, on the contrary, will be broken into smaller fragments, while certain mountains carefully traced on the charts will be resolved into mist and cloud. One section of this archipelago stretching north-east of the Parry Islands has not yet even been roughly surveyed, so that its true outlines are still unknown. The area of 720,000 square miles given to the whole insular group has consequently no more than a provisional value.

This Arctic Archipelago is readily decomposed into several perfectly distinct groups. One of these is clearly limited on one side by Smith Sound and the Kennedy and Robeson Channels separating it from Greenland; on the other by Lancaster Sound and the Barrow and Banks Straits, which form a long waterway between the Baffin and Alaska seas. The large region of Baffin Land which, with the fringing islands, continues the vast Labrador peninsula northwards, and which is washed on the east by Davis Strait and Baffin Bay, forms a second distinct group. Lastly the western lands which skirt the shores of British America, from which they are separated by winding channels and waters of a lacustrine aspect, constitute a third division of the Arctic Archipelago.

Till recently a few scattered Eskimo names alone appeared on the rough maps prepared by explorers. Meeting small groups of natives only at long intervals, these pioneers had themselves to complete the nomenclature of the polar regions, and as the work of exploration was carried out almost exclusively by British and American navigators, English names, those mainly of kings, queens, presidents or leading statesmen, were naturally given to the various capes, headlands, straits, gulfs, inlets, mountains, and islands. The names of illustrious seafarers and naturalists were also largely employed to designate the geographical features of the Arctic Archipelago, which is politically assumed to form part of British

North America, although no formal possession has yet been taken or at least ratified.

In the history of geographical discovery the explorations of these regions is inseparably associated with the quest of the "North-West Passage," and the attempts to reach the North Pole. The names of Sebastian Cabot, Frobisher, Davis, Bylot, Baffin, and John Ross are intimately connected with the insular coastlands, which form a northern extension of Labrador. Kane, Hall, Hayes, Nares, Markham and Greely are amongst the most conspicuous of those who forced their way through the narrow ice-obstructed channels to the Paleocrystic Sea. Parry was the first to penetrate through the Lancaster and Barrow Straits towards the Asiatic waters; Hudson Bay was justly named after the navigator who discovered, or at least explored it, possibly following in the track of Sebastian Cabot; the Boothia Felix Peninsula, within which lies the station of the magnetic pole, recalls the expedition in which James Clarke Ross took a leading part; lastly, the western islands near the shores of British North America perpetuate the triumphs or glorious failures of the Franklins, Collinsons, MacClures, Kelletts, MacClintochs, and Schwatkas.

INSULAR GROUPS.

The broad marine waters separating the Arctic Archipelago from Greenland are extremely deep at their entrance, the sounding line recording 2,000 fathoms off Cape Farewell, and 1,500 under the latitude of Hudson Strait. Farther north Inglefield would appear to have measured 2,600 fathoms without touching the bottom, and the sea is everywhere deep enough for the largest icebergs to drift freely, although often sinking 250 fathoms below the surface. Melville Bay reveals depths of over 400 fathoms within 10 miles of the shore, and Ross obtained soundings of 950 fathoms at the entrance of Smith Sound. In these seas, kept in motion by the action of swift currents and counter-currents, the navigation is mainly free in summer except along certain parts of the seaboard blocked by floes or obstructed by convoys of icebergs. But farther north the floating ice in the narrow channels, failing to find a sufficiently broad outlet towards the southern seas, becomes piled up in confused masses difficult to penetrate. One of the explorers who traversed these rugged spaces compared them to the houses of New York with their gables, turrets, and chimneys. Hayes took 31 days of superhuman efforts to cover a space of 75 miles in a bee line, but estimated at 550 with all the windings and detours. These prodigious accumulations are explained by the quantities of ice sent down from all sides. On the east the Humboldt Glacier incessantly discharges great fragments from its frontal wall; from the north come other masses impelled by the winds which frequently blow from that quarter; from the west two fjords contribute a steady stream of blocks of all sizes. Nevertheless the straits are sometimes partially disencumbered and thrown open to exploring vessels by the rapid currents and fierce northern and north-eastern gales, which prevail especially in winter.



DRIFT-ICE ON THE ARCTIC OCEAN.

THE POLAR SEA AND ITS APPROACHES.

North of the Robeson Channel and Parry Island stretches that Polar Sea which the first American explorers (Kane, Hall and Hayes) supposed to be "free," but which Nares and Greely afterwards found to be filled with "old ice," the accumulations of different epochs partly melting in summer and again frozen during the long winters. According to Greely the pack-ice here rarely exceeds 7 or 8 feet, although in one of the fjords of Grinnell Land some was found apparently over 12 feet thick. The crystalline mass increases in thickness during the winter and even in spring to the middle or end of May, and then diminishes in summer. Hence the thicker masses accumulated in the straits and in the Paleocrystic Sea would not appear to be old ice which has remained stationary since its formation, but heaps of blocks pressing one against the other, and gradually growing in size by the addition of other fragments either thrown up on top or drifting underneath.

In the Polar Sea much of the drift ice differs in form from the Greenland icebergs. Instead of rising in sharp points, precipitous sides, and irregular domes, it generally presents vertical walls and flat upper surfaces, thus resembling the prodigious cubic blocks seen in the Antarctic waters. Greely and his companions observed nearly a hundred from 30 to over 300 yards thick. As in the Austral seas these regular masses do not originate, like the Greenland icebergs, in glaciers discharging their contents seawards far beyond the coastline, but they are "land ice" deposited on some level plain and then gradually pushed forward by the pressure of the inland pack, and thus at last sent adrift like a raft.

In winter nearly all the islands of the Arctic Archipelago are united with each other and with the American mainland by continuous frozen masses, consisting of old fragments soldered together by young ice. But despite the floes and other icy fetters covering the Arctic seas, the currents and tides still make their way through all the straits and sounds. The early navigators who penetrated into the polar waters in search of the North-West Passage carefully observed the undulations of the tidal waves, in the hope that their course might indicate the quarter whence came the great Pacific current. But these phenomena, influenced by the most diverse conditions, form of the basins, breadth and depth of the channels, direction of the winds, alternations of temperature, salinity of the water, quantity of drift ice, have frequently perplexed and deceived seafarers, rather than aided them in their researches.

The prodigious accumulations of ice often observed in Smith Sound and the Kennedy and Robeson Channels seems to be in a large measure due to the conflicts of opposing currents in these confined spaces. One such current is a branch of the Atlantic Gulf Stream, which frequently brings driftwood and wreckage from great distances. But the most powerful current is that of the Polar or Paleocrystic Sea, which often breaks up the ice-floe, and sweeps its fragments away to Baffin Bay and the Labrador waters. The large driftwood sent down through Robeson Channel shows that this current comes from beyond the Polar Sea, on the shores of whose basin no trees grow except dwarf willows scarcely an inch high.

But the driftwood here in question appears to be that of the walnut, ash, or pine, which could come only from the temperate zone. Possibly some of it may be brought from south Japan with a branch of the Kuro-Sivo, entering Bering Strait and then sweeping round to the north-east in the direction of Greenland.

In Lancaster Sound, and the other channels through which Baffin Bay com-

Fig. 36.—CHANNELS LEADING TO THE PALEOCRYSTIC SEA.

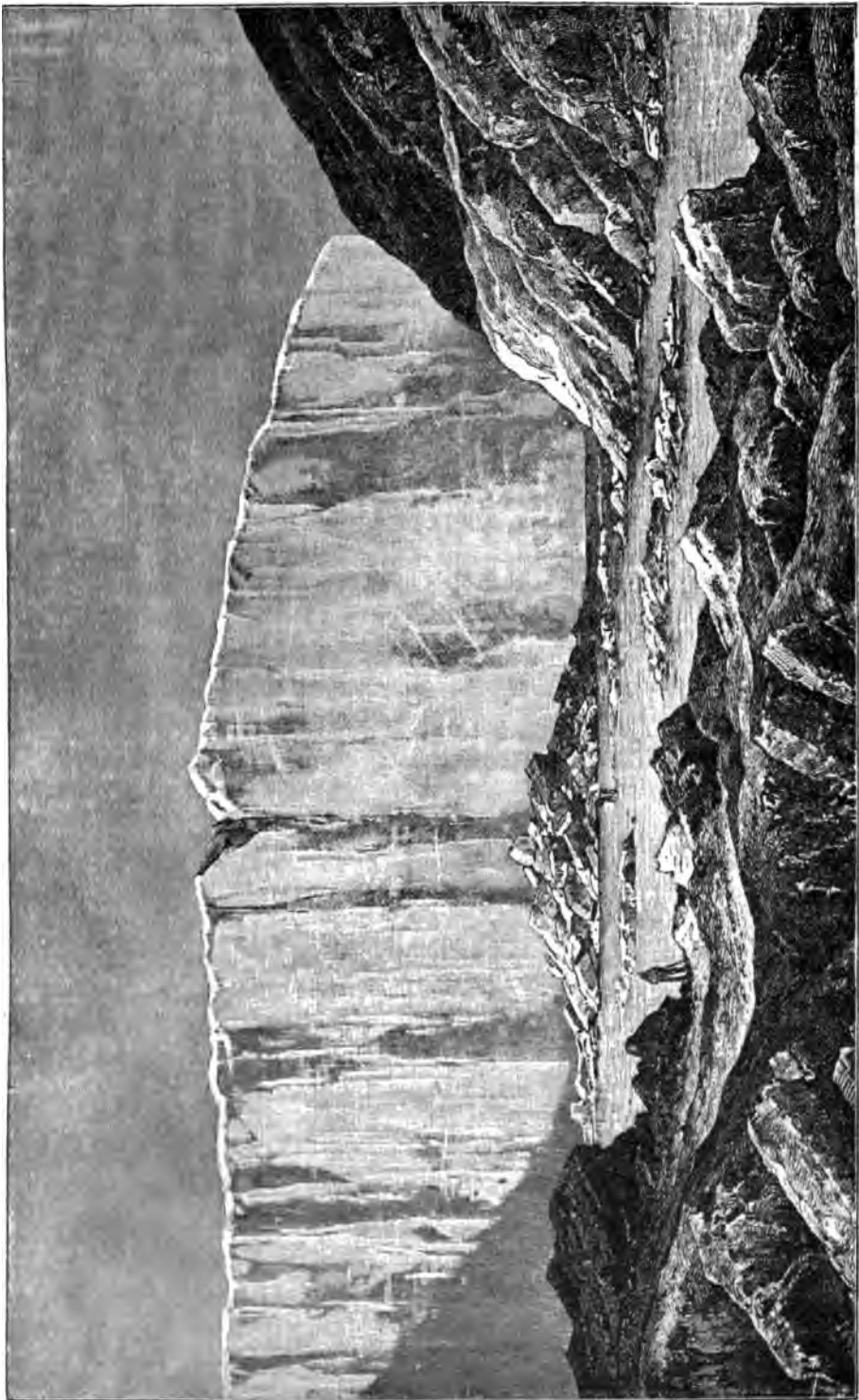
Scale 1 : 7,000,000.



municates with the west polar waters, the tides are very low ; the highest scarcely exceed forty inches, and are usually not observed at all. Under the pack south of Melville Island the low tides rise only one or two inches. In all these inland channels the icebergs are also of very small size. During the whole of his voyage from Lancaster Sound westwards, Parry met none rising more than 30 feet above the surface. The humidity which is precipitated in these regions under the

form of snow or rain is far less than in Greenland. During a whole year Parry

FIG. 37.—FRONT OF THE LADY HENRIETTA GLACIER, GRINNELL LAND.



recorded only forty-three days when a few drops of rain or flakes of snow fell, and

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explorers occasionally recognise their tracks in the snow after an absence of a twelvemonth.

GRANT AND GRINNELL LANDS.

The lands facing Greenland, west of Smith Sound, Kennedy and Robeson Channels, do not appear to form a single island; but in any case they are profoundly indented by fjords and broken into peninsulas. Grant Land, the northernmost of the Arctic Archipelago, is connected only by a mountainous isthmus with its southern continuation, Grinnell Land. Grinnell Land itself is limited southwards by Hayes Sound, which, according to all the surrounding natives, is not a fjord or inlet, but a strait passing right through to the western seas. Filsmere Land, as the district south of this strait has been named, forms, with the still more southerly Lincoln Land, the region known to the Eskimo by the name of Umingman Nuna, that is, "Land of the Musk Ox." It is separated from the island of North Devon by Jones Sound, which is at times completely blocked by the ice-pack. In 1853 Belcher found Jones Sound quite free, and navigated it for a distance of about 250 miles. It is one of the channels opening in the direction of the North Pole, and it is surprising that none of the Arctic explorers have yet tried to reach that goal through this lateral and apparently more easy route.

Aldrich and his party, who advanced nearly 250 miles west of Robeson Channel, along the shores of the Frozen Ocean, saw no mountains in this part of Grant Land. The highest ridges scarcely exceed 1,000 feet, nor are the hills anywhere disposed in continuous chains, but scattered in irregular masses, furrowed by ravines in all directions. Here the ice was everywhere compact and solid, and seemed very old, without any fissures and covered with a thick névé. From the headlands no trace could be detected of open water, and on the coast plains it was impossible to say where the land ended and the sea began. Cape Alfred Ernest, the extreme point reached by Aldrich, probably forms the north-western headland of Grant Land, for the coast seems here to trend southwards in the direction of the Greely Fjord, discovered in 1882 by Lockwood. Off this coast the water seems shallow, Markham having touched the bottom in 70 feet about 45 miles from land. But near Cape May, in the south-east, Greely's expedition failed to reach the ground with a line of 135 fathoms.

The United States Mountains, a range running south-west and north east, forms the southern limit of Grant Land. This somewhat uniform range presents a series of long snowy crests, with a mean altitude of from 3,000 to 4,000 feet. Towards the centre of the island, which Greely's party traversed in various directions, a peak, named Mount Arthur, has an elevation of 4,500 feet, and is probably the culminating point of Grinnell Land. Some large glaciers flow from the United States range, but the permanent snows do not extend southwards, and here the island is completely free of ice and snow during the summer. For a space, estimated by Greely at 150 miles east and west, with a mean breadth of 40 miles, the surface is carpeted with green grasses and flowers, and diversified with meres, rivulets, and cascades. The phenomenon of such a climate under 81°

and 82° north latitude is attributed by Greely to the slight annual snowfall, and the precipitous form of the rocks, on which the snow is unable to lodge.

South of Grinnell Land the Ellesmere coast facing Greenland continues to present a line of steep cliffs along the shores of the straits, but the interior has not yet been visited. All these shores, both of the Archipelago and Greenland, are disposed in parallel terraces at levels up to a height of 1,500, and even 2,000 feet, and the shells embedded in the rocks are identical with those of the neighbouring seas. On the flanks of one mountain Kane counted forty-one regular steps like those of a gigantic staircase. On the margins of lakes, which were formerly marine inlets gradually separated from the sea, Greely also found large driftwood sufficiently preserved to be useful as fuel. The banks of Archer Fjord, an inlet of Lady Franklin Bay, contain thick beds of vegetable fossils in the form of coal.

BAFFIN LAND.

Baffin Land, which is the largest island in the Arctic Archipelago, and which is shown on numerous maps as divided into several fragments, skirts the west side of the Greenland waters between Hudson Strait and Lancaster Sound. It has a total area of at least 265,000 square miles, and this vast expanse is considerably increased by its numerous insular dependencies. The two most important of these islands are Uivang at the north-east corner, which has received the name of Bylot in memory of the almost forgotten captain under whom Baffin served, and Tujukjuak, the Resolution Island of the English charts, which lies at the south-east angle towards the entrance of Hudson Strait. Baffin Land itself is disposed in three sections, Aggo in the north, Akudnirn in the middle, and Oko in the south, these Eskimo terms being explained to mean the "windward land," the "midland," and the "leeward land."

The east coast of Baffin Land is dominated by a gneiss and granite range, whose sharp crests in several places reach an altitude of 6,500 feet and even more. The lofty headlands projecting eastwards rise precipitously above the surface, and beyond them in the interior isolated or serrated black crags are seen towering above the white expanse of the snowfields. One of the best known of these eminences is Raleigh Peak (4,600 feet), which was so named by Davis in 1585, and which presents the aspect of a great Alpine summit rising to the south of Exeter Bay. The seaboard is indented by fjords which penetrate far inland, terminating at low ridges, by which they are separated from other inlets of similar formation on the west side. The whole region is thus divided by deep fissures into parallel sections, which a subsidence of the land would resolve into separate insular masses. These fissures themselves are subdivided at intervals by transverse ridges, either natural rocky barriers or the remains of moraines, which for the most part enclose small lakes or tarns.

Notwithstanding the inaccessible character of the land, due to its rugged surface, the sudden changes of temperature, the blinding snowstorms, fogs and fierce gales which prevail, especially in summer and autumn, the Eskimo succeed

in crossing Baffin Land from sea to sea, and seven of their routes are indicated on the map prepared by Boas. Whalers have also crossed from east to west the south-western part separated by Fox Strait from Melville Peninsula. In 1876 Roach, after traversing a small coast range on Cumberland Bay, descended from lake to lake to the vast plain where lies the Nettilling, or Kennedy Lake, one of the chief trysting-places of the Eskimo hunters and fishers.

From the few explorations made in the interior it appears that, west of the eastern coast range, Baffin Land is occupied by granite hills, which fall gradually down to the silurian and fossiliferous limestone western plains. Lakes, which were formerly marine gulfs and channels, are dotted over the centre of this plain, on which are still found the remains of the walrus, whale and other marine animals. Amakjuak, one of the lakes not yet visited by Europeans, is reported by the Eskimo to lie not far from the north side of Hudson Strait. The much larger Lake Kennedy is connected with Cumberland Bay on the east side by an almost continuous chain of meres and ponds, although its overflow is discharged westwards to Fox Channel.

In the mountains of Baffin Land occur mineral deposits that have not yet been worked. Coal and graphite have been found in many places, but steatite (soap-stone) and beds of driftwood are less abundant. The former is used by the natives for making their lamps, and even the latter has acquired some value since the industrial conditions have been so profoundly changed by contact with the Europeans.

In the islands skirting the north side of the long line of channels between the Baffin and Bering seas, the mountains present in many districts a formidable appearance with their steep escarpments, terraced cliffs, and vertical walls. But the average height of the peaks, crests, or plateaux, scarcely exceeds 800 or 1,000 feet. Few summits attain an elevation of 1,650 feet, although in this part of the Arctic Archipelago some eminences rise to 2,300 feet and upwards. Such is that in North Kent, an islet at the north-west extremity of Tujau, the North Devon of the English charts. The rocky shores of this island and of the other members of the Parry group stretching westwards, present here and there the fantastic outlines of fortresses whose ramparts consist of horizontal layers of limestone and argillaceous sediment, forming an alternating series of raised and depressed surfaces. Other promontories form huge masses of gneiss interspersed with garnet; some again are columnar basalts; but in no part of the archipelago has the presence of volcanic cones, ashes or scorix been placed beyond doubt.

In the Parry group the oldest formations occur in the east, the more recent in the west. Thus north of Lancaster Sound the rocks are crystalline, granite or gneiss, followed westwards by silurian strata, and still farther west by carboniferous sandstones and ferruginous limestones in Bathurst, Byam, Martin, and Melville Islands, and other limestones associated with jurassic rocks in Prince Patrick Island in the extreme north-west. The coal measures of the Parry group date from the same age as those of Bear Island, north of Scandinavia, and are overlaid by the same marine limestones. These coincidences at such vast distances ..

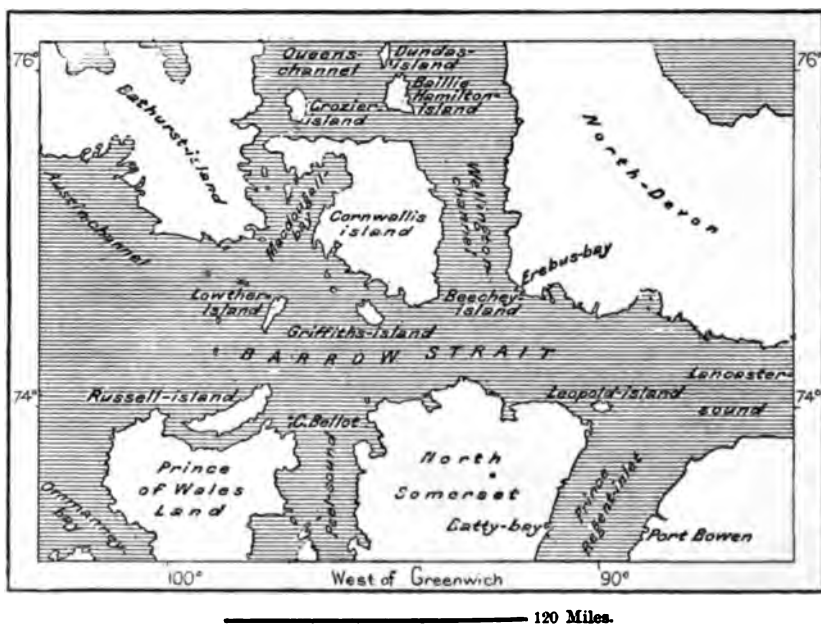
have been appealed to in support of the hypothesis of a great continent which formerly comprised all the Arctic regions, but which has partly subsided in both hemispheres.

THE WESTERN INSULAR GROUPS.

West of Baffin Land the peninsulas and islands skirting the northern shores of British America must be regarded as a geographic unit independently of their present junction with or severance from the mainland. The channels winding between continent and islands are relatively shallow, nowhere more than 260 fathoms deep, so that a slight subsidence of the waters would transform the

Fig. 38.—BARROW STRAIT.

Scale 1 : 5,000,000.



insular groups to peninsulas. On the other hand a corresponding upheaval of the marine level would convert into fjords and even straits, the chains of lakes which at a former epoch were evidently branches of the sea. The contours of the archipelago as traced by the present coastlines are a passing phenomenon of no permanent geographical importance. In this respect the whole peninsular region, limited southwards by a line continuing westwards the north coast of Labrador, and terminating at the Mackenzie delta, forms part of the Arctic Archipelago.

The Melville peninsula, attached to the continent by a narrow neck of land; the Boothia Felix peninsula, which the first explorers supposed to be an island; lastly Adelaide Land, scarcely severed from the mainland by Sherman Bay, thus belong to the same natural division as King William, Prince Albert and Bering

Lands. The abortive straits indicated on the side of Hudson Bay by the Wager and Chesterfield inlets, and on that of the Polar Sea by Sherman Bay, are the natural limits of this region of the Arctic insular world.

Throughout the whole of these peninsulas and islands there is a complete absence of mountain ranges properly so called. The highest summits observed by explorers do not exceed 1,650 feet, and their apparent relief is even diminished by the snows covering hills and plains alike. Nevertheless, the surface is much broken and often studded with lakes. In Prince Albert Island some peaks on the west coast have the appearance of volcanic cones, though MacClure was unable to determine their true character.

For vast spaces the coastlands consist of dolomites, whose nearly horizontal strata stretch away uniformly for immeasurable distances. Near the shore the bed of the sea, visible to a considerable depth thanks to its whiteness, resembles a marble pavement. As in other parts of the Arctic Archipelago numerous indications of upheaval have been observed in this region. Here and there old beaches are found covered with shells and driftwood, and in Cornwallis Island one of these beaches now stands 1,000 feet above sea-level. On the shores of Banks Island MacClure and his party collected fossil wood, petrified acorns, and branches, and these objects are now preserved in the English museums not only for the sake of their scientific value, but also as mementos of these heroic expeditions. Even on the coast of the Paleocretaceous Sea Greely's companions discovered petrified forests, and so early as 1826 Robert Jameson had verified the existence of fossil plants attesting a former temperate and even tropical climate in these Arctic lands.

CLIMATE.

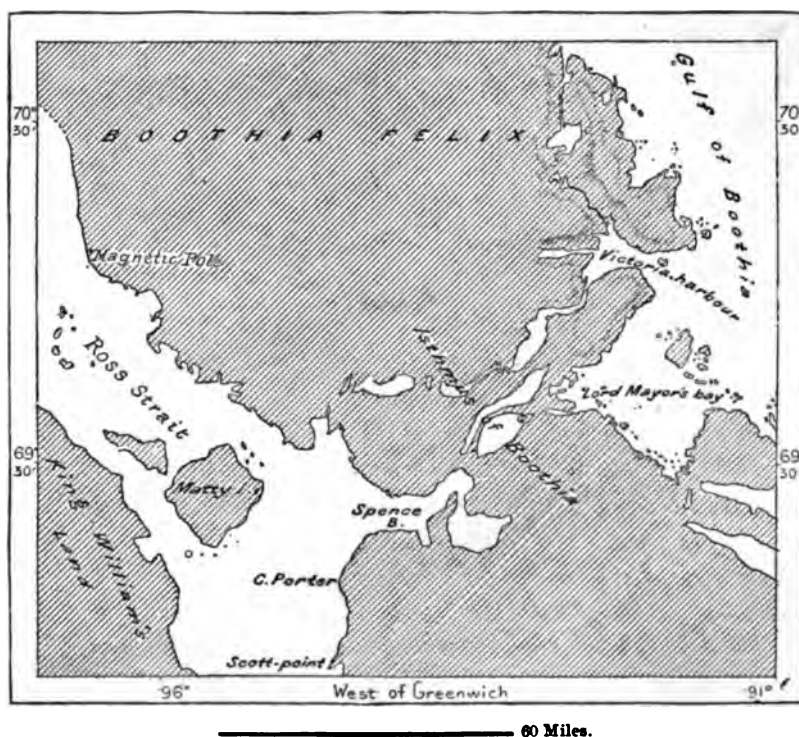
But the climate has undergone a vast change since this vegetation flourished; it will doubtless pass through further modifications, and one of the proofs of its instability is the incessant oscillation of the magnetic pole and of a pole of low temperature above the Arctic Archipelago at a great distance from the true North Pole. In these regions the magnetic needle no longer serves to indicate the north, as was already remarked by Forster in the last century, so closely do the lines of unequal declination approach each other. They converge from all quarters, not, however, in the direction of the geometrical north, but towards the southern part of the Boothia Felix peninsula. By following the indications of the compass James Clarke Ross was thus able approximately to determine the place where the needle points towards the centre of the planet, and this twenty years before the circumnavigation of America had been completed. On the site of the observatory the deflection from the vertical was still one-sixtieth of a degree; consequently the actual position of the pole should be a short distance seawards in the direction of the south-west. At that time, that is, in 1831, the converging point of all the magnetic currents in the northern hemisphere was 1,370 miles south of the true pole. Thus was discovered under another form the "polar rock," the magnet which mediæval mariners supposed to exist in the northern regions, and which

attracted the waters and ships. Round this rock the sea was supposed to rush in cataracts into the depths of the earth.

The northern lights were also formerly believed to increase in number and intensity in the direction of the pole, thus illuminating, like the solar rays, the long night of 50, 100, or even 150 days that Arctic navigators have to pass in those high latitudes. This foregone conclusion of physicists has not been verified by observation. The auroral coruscations are in fact rarer and usually less vivid in the Arctic Archipelago than in Labrador and North Scandinavia. They mostly roll upwards in the form of whitish ribbons, undulating in space like streamers of

Fig. 39.—MAGNETIC POLE.

Scale 1 : 2,500,000.



pale light against the black ground of night. The phenomena of refraction are also very common in the unequally heated atmospheric strata resting on the polar seas. Islands, vessels, hills, and icebergs assume the most fantastic forms; the moon becomes oval or even polygonal and develops an encircling halo, while several suns shine in the firmament, all connected by crosses or circles of light. Refraction also at times elevates the line of the horizon far above its true position, as when Parry sighted a coastline 100 miles distant. The vibrations of sound become equally intensified, the scrunching of frozen snow under passing sledges being heard at a distance of nine or ten miles.

Apart from the consideration of latitude, the annual temperature is lower in

the Arctic Archipelago than in Greenland itself. At Port Rensselaer Kane recorded 97° below freezing-point Fahrenheit; Nares and his companions endured a cold of 90° , and MacClure 94° at Mercy Bay in January. But meteorologists accept these figures only as probable approximations, for the mercury freezes at -40° F. while spirit thermometers are untrustworthy beyond -58° F. In any case the winter temperature in these regions is extremely low, averaging -32° F. in Grinnell Land and the Parry Islands, and at Port Rensselaer -36° F. in March. The only month when the mercury stands above freezing-point is July, when the moisture is precipitated in the form of rain, snow or sleet prevailing during the rest of the year. Even farther south the mean winter temperature is about -22° F. on the west side of the Davis and Baffin Seas.*

By a most remarkable meteorological phenomenon all winds, from whatever quarter they blow, have the effect of raising the local temperature in these regions. During calms, that is, the normal winter weather, the heavier and colder air prevails with higher barometric pressure. But when the equilibrium is disturbed and the atmospheric currents rush in, the actual cold diminishes considerably, although it is more felt and more irksome to travellers than the intense cold of calm weather. As a rule a rapid rise of temperature is not welcomed by explorers, because followed by aerial disturbances and storms. The increase of heat is also generally accompanied by thick fogs, which greatly contribute to the disappearance of the ice-pack. It breaks up and, as the Eskimo say, "is eaten by the fog."

FLORA AND FAUNA.

Although of a lowly type, the flora of the Arctic Archipelago is not lacking in beauty. In Grinnell Land the "willow groves" scarcely one or two inches high cover extensive tracts with green tints, while the lichens of all kinds—brown, red, yellow, and green—seem to present more vivid shades of colour than in other latitudes. Vast spaces are also covered with red saxifrages and with the dryas, a tiny rose with tufts of white flowers. In a few weeks the plants complete their life history, bursting into bloom almost as soon as they appear above the snows. The margins of many lakes are fringed with tall grasses 20 inches high; but the vegetable kingdom supplies nothing suitable for fuel except driftwood, and even this is plentiful only at the entrance of Davis Strait and on the coasts facing the Bering Sea. The lands, however, contiguous to the American mainland produce a lowly plant, the *cassiope tetragonia*, very rich in a resinous substance which is carefully collected and used as "firewood." The plants gathered during

* Temperatures in various parts of the Arctic Archipelago:—

	North Latitude.	Mean Temp.	Summer Temp.	Winter Temp.
Winter Island . . .	$66^{\circ} 11'$	$+9^{\circ}$ F.	$+34^{\circ}$ F.	-20° F.
Repulse Bay . . .	$66^{\circ} 25'$	$+6^{\circ} 8$	$+40^{\circ}$	-24°
Igloodik . . .	$69^{\circ} 20'$	$+5^{\circ}$	$+34^{\circ}$	-21°
Port Bowen . . .	$73^{\circ} 14'$	$+4^{\circ}$	$+36^{\circ}$	-24°
Port Leopold . . .	$73^{\circ} 50'$	$+3^{\circ}$	$+33^{\circ} 8$	-32°
Mercy Bay . . .	$74^{\circ} 6'$	$+2^{\circ}$	$+37^{\circ}$	-28°
Port Rensselaer . . .	$78^{\circ} 37'$	-1°	$+38^{\circ}$	-31°

the Penny expedition, chiefly along the shores of the Wellington Channel between North Devon and Cornwallis Island, comprised as many as fifty-four phanerogams.

The islands have also their fauna; like the American mainland, they are inhabited by the wolf, fox, hare, lemming, ermine; and the Eskimo speak of them

Fig. 40.—POLAR SCENERY—BELLLOT ISLAND.



as the "Land of the White Bear" in a pre-eminent sense. The musk ox roams as far north as Grinnell Land, which was formerly also frequented by the reindeer. At least one species of bird, the ptarmigan (*lagopus rupestris*), passes the whole year in the same region, to which about thirty birds of passage flock in

summer. Aquatic fowl, with brilliant plumage, visit the bays for a few weeks, and then take wing for the continental plains. According to Otto Torrell the species of indigenous birds are twice as numerous in the wooded parts of boreal America as in the islands south of Lancaster Sound, while in these the proportion is three times greater than in the Parry Group and Grinnell Land. No birds migrate beyond the terminal headland of this region.

The family of passerines, represented in British North America by twenty species, has only two in the Parry Islands, where is also found a solitary bird of prey, the *stryx nyctea*. The North Polar islands, like those of the Antarctic region, are frequented by myriads of the eider duck (*somateria mollissima*), and here the various families of birds always congregate together in large colonies in such a way as not to encroach on each other's domains. When first visited by the Arctic explorers those frequenting the more remote islands of the Archipelago were so tame that they allowed themselves to be taken by the hand.

Like the birds the fishes diminish in the direction from south to north. Within the polar zone the marine waters contain at most about a dozen species, while the freshwater lakes are almost entirely uninhabited, though one variety of salmon is still met so far north as Grinnell Land. North of Cape Sabine in the channels leading to the Paleocrystic Sea not a single cetacean has been found, and only one species of seal penetrates beyond these channels. But in the cold waters of Baffin Land the large cetaceans were formerly very numerous. The early navigators speak of schools comprising as many as a hundred whales. About the year 1840 some one hundred and fifty whaling vessels still yearly frequented these seas, and especially the neighbourhood of Cumberland Bay. But in 1860 they were reduced to about twenty, and now scarcely any are seen, the whale having been almost exterminated in those high latitudes. Here, however, the seal still swarms, and some inlets are inhabited by the cod; the variety captured off the south coast of Baffin Land is said to have a more delicate flavour than that of Newfoundland.

The mosquito, scourge of the Arctic regions south of 70° north latitude, almost entirely disappears in the more northern islands. One variety of spider reaches as far as the Parry group, which, however, lies beyond the range of the beetle and butterfly. Yet these insects are still numerous in the islands near the mainland, where some species are remarkable for their brilliant colours.

INHABITANTS.

The insular Eskimo, far less numerous than those of Greenland, are undoubtedly allied to them in race and speech, although long isolation has developed considerable diversity amongst the several groups. In an area approximately estimated at 800,000 square miles the whole population scarcely exceeds two or at most three thousand souls. The different tribal or family subdivisions are generally named from the districts usually occupied by them. Thus those settled on Hudson Strait are the Sikosuilarmiuts, that is, the *Miut*, or "People, of the Iceless Shore." So also the Aggo-

miuts and Akudnir-miuts (Oko-miuts) of Baffin Land, and many others. One of the most divergent tribes, at least in their social usages, are the Talirpings, the only community which, till recently, occupied an inland territory. They dwelt on the banks of Lake Kennedy, inhabited by the seal; but now they reside on the seashore, like all the natives of the Archipelago. Like them also, they have greatly diminished in numbers since the arrival of the European explorers. One of the strongest, if not the strongest, of all the Inuit groups is that of the Nechilliks, who formerly held the isthmus of Boothia, but who, since the middle of the century, have migrated towards the northern and western shores of King William Land. Here they find seal and fish in abundance, and hunt the reindeer in summer, and are thus able to lay up sufficient supplies for the long winter days.

About the second decade of the present century the natives of Cumberland Bay were said to number about fifteen hundred persons; but in 1884 Boas estimated at a hundred, more or less, the whole population of Baffin Land, one of the least deserted regions of the Archipelago. Contagious diseases, and especially syphilis, introduced by the white sailors, have certainly been the cause of these deplorable ravages. In 1883 diphtheria, attributed by the Eskimo to Boas himself, was added to the other disastrous epidemics, while the extermination of the race is hastened by infanticide, prevalent in some tribes. The famines, by which the population has often been decimated, have often wrongly been assigned to the falling off of the fisheries. Doubtless, the whale has almost entirely disappeared, and is now pursued by the Eskimo only in Hudson Strait and the neighbouring waters. But the seal, which is not captured by the European whalers, is still found in multitudes along the shores of Baffin Land. In spring, however, it is difficult to take, the ice having become too weak to bear the hunters, while still too strong to be forced by their kayaks. They are also frequently kept ashore by continuous stormy weather, and the distress is greatly increased when a member of the tribe happens to die, custom then requiring all hunting and fishing to be suspended for several days.

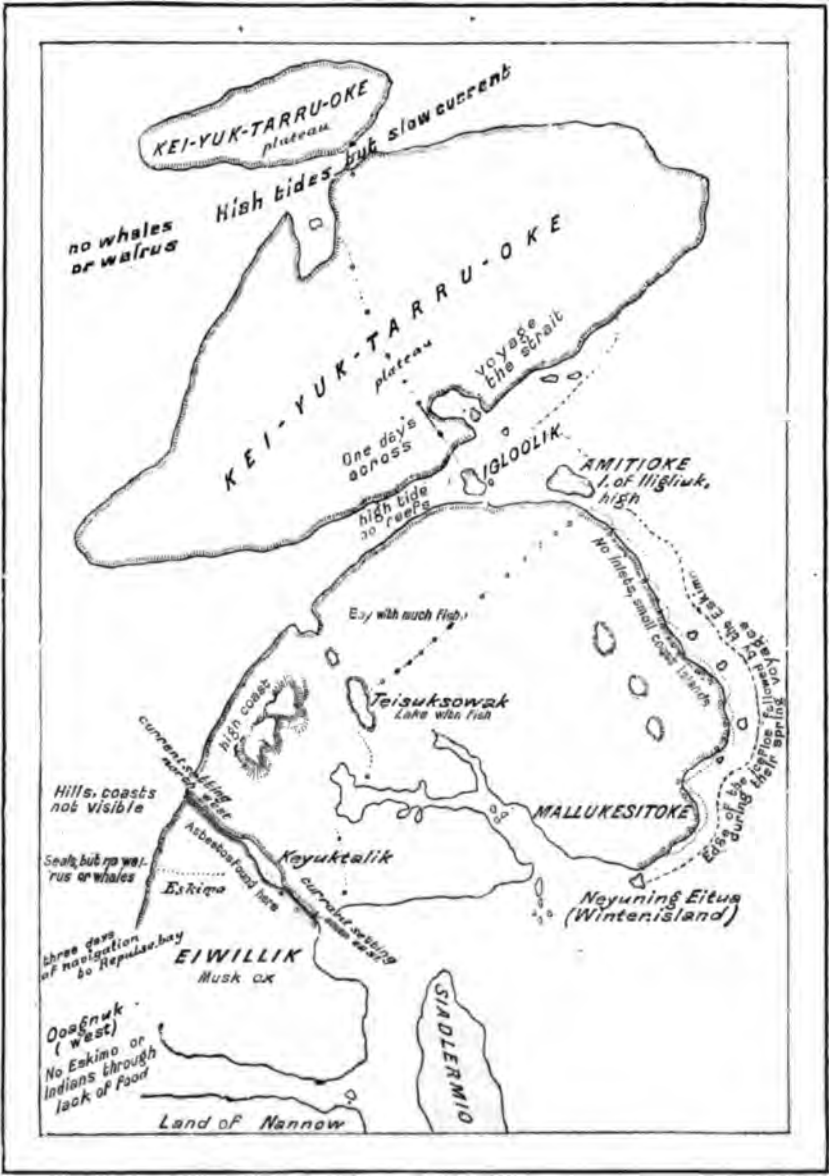
Vestiges of old habitations have been met by most explorers at various points of the seaboard. The remains of cabins occur in all the Parry Islands, and large villages formerly stood on sites hundreds of miles remote from all present camping-grounds. The objects of human industry found nearest to the pole were a sledge, a lamp, and a scraper, collected by Fielden on the shores of the Paleocrystic Sea six or seven miles below 82° north latitude. Greely also discovered some ruins in the interior of Grinnell Land, which, however, seemed to have been merely temporary structures. In this region he draws the limits of the zone of permanent habitation to the north of 80° north latitude, a line coinciding with the extreme frontier of the territory roamed over by the reindeer and visited by the walrus.

The natives have legends about the Tornits, an older race of barbarians unacquainted with the bow and arrow, but skilled magicians. In certain mythical tales they are confounded with monstrous beings, said to have had human bodies and the paws of dogs. The Tornits were either exterminated or else died out, because "the world was too small to contain both races." The Eskimo themselves, though

the least numerous of men, are confirmed Malthusians ; although lost as it were in the immensity of space, the earth still seems scarcely rich enough for their support.

Compelled to lead a nomad life by the necessities of the chase, fishing and

Fig. 41.—MELVILLE PENINSULA AND NEIGHBOURING ISLES, FROM AN ESKIMO CHART.



trade, the natives are familiar with vast stretches of their insular domain. By inquiry made at a small number of intermediate stations an intelligent explorer might easily make himself acquainted with all the routes lying between the shores

of the Baffin Sea and the Mackenzie delta. But in undertaking long expeditions the Eskimo hunters require to take every precaution, for many communities are separated by the traditions of blood and the vendetta. Even those not rendered hostile by hereditary feuds foster feelings of mutual jealousy and suspicion. Amongst the Nechilliks a woman armed with a knife advances to meet all strangers, offering them peace or war. After certain preliminaries they are received into the tribe on a footing of equality; wives are assigned to them and they cease to belong to the maternal group. Marriage is, in fact, one of the chief causes of expatriation, the husband nearly always leaving his own people to dwell with those of his bride. The adoption of strange children also contributes variously to intermingle the tribes, and half-breeds have become numerous since the whalers have visited these regions and founded stations, round which the natives have grouped themselves. So great is the influence of the whites that from the shores of the Baffin Sea to Alaska the medium of intercourse is a sort of Anglo-Eskimo, into which some Danish, Portuguese, and even Polynesian words have also been introduced. The French term "troc" is usually employed for barter of all kinds; but despite all these foreign additions, the vocabulary of this jargon is very limited.

The Eskimo of the Arctic Archipelago recognise no authority. Custom is their only law, and when some unforeseen event upsetting all their calculations requires them to depart from established usage the change must be made by common consent. The natives have a vague belief in a supreme being, but they carve no idols, nor do they perform any ceremonies to escape from a future life of everlasting winter or secure the blessing of an eternal summer. Marriages are generally arranged long beforehand, the girls being occasionally betrothed in their cradle. Men and women, as well as the different tribes, are distinguished by the cut of their hair, the fashion of their dress, and the tattoo marks on nose, cheeks, and chin, but the practice of tatooing is falling into abeyance.

Although recognising no masters the community formerly paid great deference to one of the elders, the wise man who knew everything, and who was consulted on all weighty matters. He indicated the auspicious days for changing residence, undertaking journeys and hunting expeditions. He presided at the public feasts and interceded for the community with the propitious deities. After his death he received great honours, and in his grave were deposited arms, utensils, ornaments, and other valuables; especially hunting and fishing gear wherewith to provide himself with food in the other world.

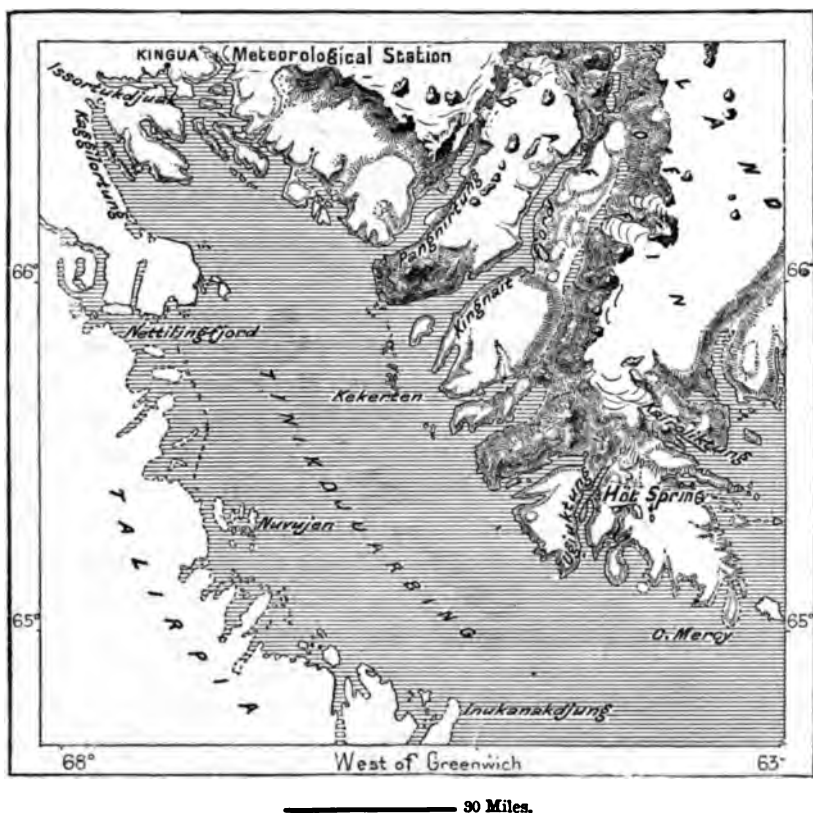
Instead of the kayak the natives now generally make use of boats purchased from the whalers. But they retain most of their old industries, and as artists greatly excel the Labrador and Hudson Bay Eskimo. Their garments, implements of the chase, and carved objects are made more solidly and with greater taste. Their surprising sense of locality is alluded to by all explorers, and they have often prepared charts, the accuracy of which has been recognised by European mariners. To one of these charts executed by the Eskimo, Iligink, Parry was indebted for the discovery of the Fury and Hecla Strait.

TOPOGRAPHY.

A region such as the Arctic Archipelago could scarcely contain any centres of population beyond a few permanent or temporary encampments. At present the encampment most frequented by the European seafarers is *Kekerten*, situated on an island in Tinikjuarbing (Cumberland) Bay at the entrance of the Kingnait Fjord. At *Kekerten* have been established the only two whaling stations in the Arctic

Fig. 42.—CUMBERLAND BAY.

Scale 1 : 2,200,000.



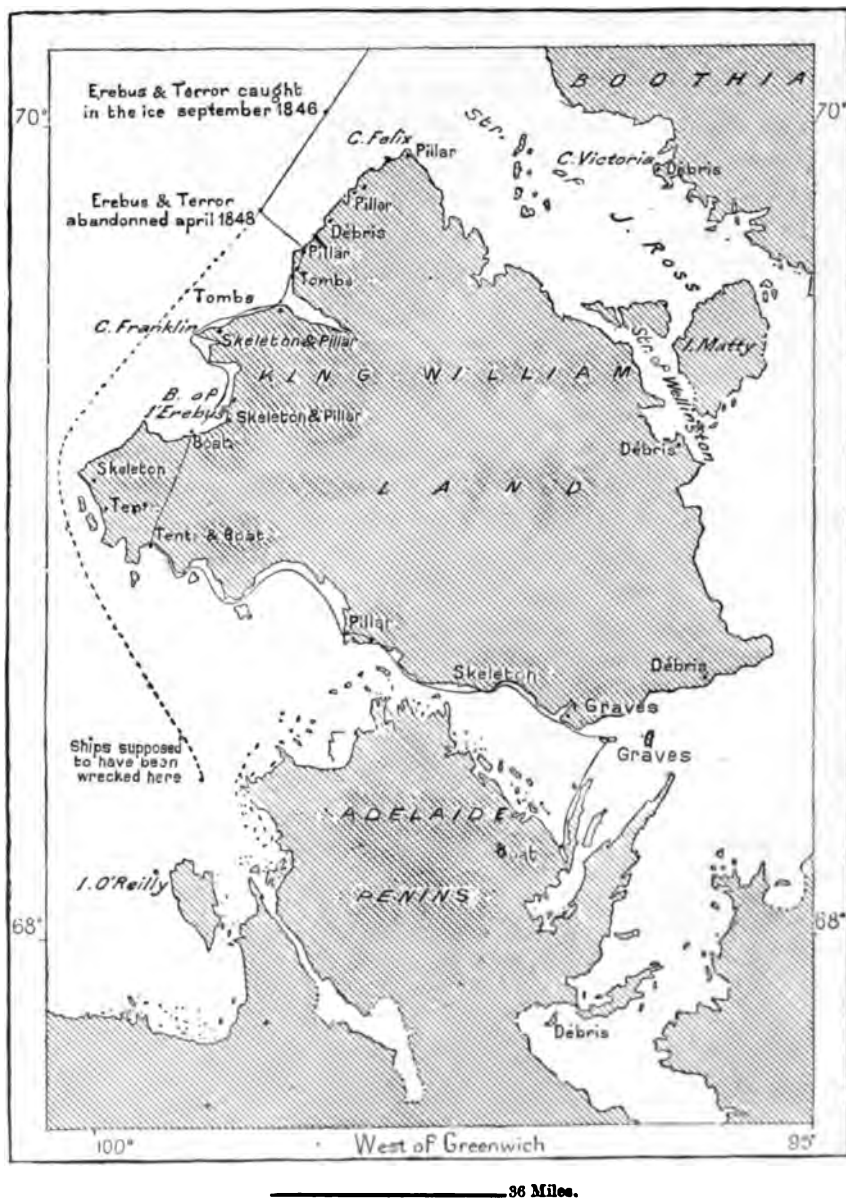
Islands, and these have attracted the natives from all quarters. *Kingua*, another group of huts at the northern extremity of Cumberland Bay, owed its passing fame to the choice made of it by the German Commission as the site of one of the circumpolar meteorological observatories. Farther south Hall discovered in Frobisher Bay a large number of objects, cordage, bricks, bits of iron, wood, and coal, which he supposed must have belonged to Frobisher's expeditions of 1576-78, and which are now preserved in the Greenwich Naval Museum. The island where these relics were found is known to the natives by the name of *Kodlunarn*, "Island of the White Man."

A few islands and inlets along the coast have also become famous in the annals

of geographical exploration, thanks to the shelter they have afforded to navigators, or else to the forcible sojourns made in them by Arctic explorers. Thus *Fort Conger* in Lady Franklin Bay, and the red syenitic headland of Cape Sabine in Ellesmere Land, recall the misfortunes of the disastrous Greely expedition.

Fig. 43. — RETREAT OF THE FRANKLIN EXPEDITION.

Scale 1 : 2,000,000.



Beechey Island at the south-west corner of North Devon was the chief rendezvous of the polar explorers, thanks to its happy position at the intersection of the straits between the Wellington, Lancaster, Barrow, Prince Regent, and Peel channels.

Winter Harbour, on the south coast of Melville Island, has been known since Parry wintered here in 1819, and here also was effected in 1853 the junction of the circumnavigation routes by the meeting of Kellett and M'Clure. A *Winter Island* is also one of the historical places in the Arctic Ocean, thanks to Parry's residence here during his second expedition, when his vessel became entangled in the "no thoroughfare" of Repulse Bay south of Melville Peninsula, and when he vainly endeavoured to cross the strait to which he left the name of his ships, the *Fury* and *Hecla*. *Port Bowen* and *Port Leopold*, facing each other on the Prince Regent Strait, where nothing is to be seen except "sandstone, snow, and ice," similarly recall the sufferings of other Arctic heroes, while Bellot Strait between North Somerset and Boothia Felix perpetuates the memory of that devoted mariner who disappeared amid the floes of Wellington Channel, and in whose honour a monument was raised on Beechey Island.

But the best-known places are those where have been discovered the traces of the retreat made by the ill-fated companions of Sir John Franklin. Such are *Point Victory*, where M'Clintock came upon the first indications of the disastrous result of the expedition; *Cape Felix* near the spot where the two vessels were blocked by the ice-pack; Erebus Bay where the graves of the dead begin to show along the beach; *Simpson Strait* where the survivors at last reached terra firma; Famine Bay, crossed by one only of the fugitives to perish in his turn a little farther on in an inlet of the Adelaide Peninsula. The calamitous end of this expedition, which gave rise to so many expeditions in search of the castaways, was the chief cause of the long suspension of Arctic exploration that then ensued. But research will in future be facilitated by the establishment of fixed stations which can be provisioned from various points of the mainland. Nor have all the resources of modern industry yet been enlisted in the service of Arctic navigation. The *Polaris* was the first steamer employed in this service, and that so recently as the year 1871. In 1850 John Ross let off two carrier pigeons in Barrow Strait, and one of these birds reached Scotland in 120 hours after a flight of 2,500 miles.

A table of the Arctic lands with their chief subdivisions will be found in the Appendix.



CHAPTER IV.

ALASKA.

THE north-west extremity of North America bears the official designation of Alaska, which according to some etymologists is derived from the native words Al-ak-shuk, or "the Great Land." This name it takes from the curved peninsula which projects to the south-east of the Bering Sea, and is continued westwards by the chain of the Aleutian Islands. *Aliaska*, the name formerly attributed to the peninsula in most written documents, has gradually yielded to the form *Alaska*, which has been extended to the whole region as far as 141° west longitude.

This region formed part of the Russian empire till the year 1867, when it was sold to the United States for a sum equivalent to about £1,500,000. Although public opinion in America had long protested against this purchase, the price is certainly low enough for a territory nearly 600,000 square miles in extent, and which is not exclusively a land of mountains, frozen lakes and snows, as has been so often asserted. Alaska possesses on the contrary vast forests, mines, and fisheries. With exception of the Seal Islands its resources have doubtless been but imperfectly developed, while the white population is still thinly scattered along the south coast, the only inhabitable district. Nevertheless, it seems strange that the Russian Government should have consented to surrender its vast possessions in the New World, which, although of no fiscal value, added not a little to the dignity of the empire. The step has been explained by the desire felt by Russia, at that time at enmity with Great Britain, of showing her sympathy with the great republic, and of sowing the seeds of future dissension between the two conterminous states.

The south-east part of Alaska is indicated by natural frontiers; starting from $54^{\circ} 40'$ north latitude, it comprises the coastlands as far as the divide formed by the coast range. But where this divide lies more than 10 marine leagues (34 miles) from the sea, the frontier towards British America will be traced at this distance parallel with the coastline. Near the superb landmark of Mount St. Elias, whose crest is probably just within the American border,* the limit becomes quite con-

* Dall's determination of 1874 gave $60^{\circ} 20' 45''$ latitude; $141^{\circ} 00' 12''$ longitude, just twelve seconds on the American side.

ventional, and has hitherto been provisionally surveyed only at the point where it is crossed by the Yukon River; it is merely an ideal meridional line drawn to Demarcation Point on the Arctic Ocean. Had the political limit followed the most salient feature of this region, it would have been drawn from Mount St. Elias towards the ranges which enclose on the east the sources of the Copper River, and then those of the Yukon and its affluents. With the addition of these upland valleys Alaska would have been enlarged by at least one-third, though its economic importance would scarcely have been enhanced, these parts of the country being almost uninhabited. The present population, estimated at less than 34,000 by the census of 1880, would at most have been increased by perhaps 2,000 or 3,000 had the whole of the Upper Yukon basin been annexed.

All the adjacent islands—Chichagov, Baranov, Admiralty, Kuprianov, Prince of Wales, Revilla-Gigedo, and the surrounding clusters of islets—belong politically to the United States, as does also the Aleutian chain as far as the island of Attu. Omitting these islands and smaller inlets, the coastline of Alaska has been estimated at about 8,000 miles. But this long stretch of seaboard with its creeks, gulfs, and bays, numerous especially along the south coast, is but of slight value under such a frigid climate. All that part of Alaska lying north of Bering Strait is, so to say, cut off by the line of the Arctic Circle.

EXPLORATION.

During the first decades of the eighteenth century the Russians had already a vague knowledge of the existence of the "Great Continent in the East," which was reached by Gvozdev in 1730. But on the maps constructed from current reports the name of Alaska is attributed to an island in Bering Strait. Systematic exploration first began in 1741, when Bering and Chirikov, the former accompanied by the naturalist Steller, the latter by the geographer Delisle de la Croyère, made independent surveys of the districts near Mount St. Elias, coasting the seaboard and Aleutian chain, but without penetrating inland. In 1745 Novodiskov reached the island of Attu from Kamchatka, and was followed by numerous adventurers. The Spaniard, Quadra, got no farther than the southern islands in 1775; Arteaga stopped short at the Aleutians, and Cook, who penetrated into the Arctic Ocean as far as Ice Cape, also confined his surveys to the coastline.

But the Aleutian Islands had already been overrun by Russian traders and hunters; the costly American peltries had found their way to the European and Chinese markets, and the extermination of the natives had begun. In 1785 Jelikov founded several settlements on the mainland, although these were occasionally designated in a general way by the name of *ostrora*, or "islands." Being absolute masters of the seaboard, and controlling the inland trade through the native hunters, the Russians were able to effect their exchanges without making long journeys into the interior. Nevertheless, they gradually became familiar with all the south-western parts of Alaska south of the Yukon. In 1829 the Russian half-caste Kolmakov ascended the Nushagak, flowing to Bristol Bay, as



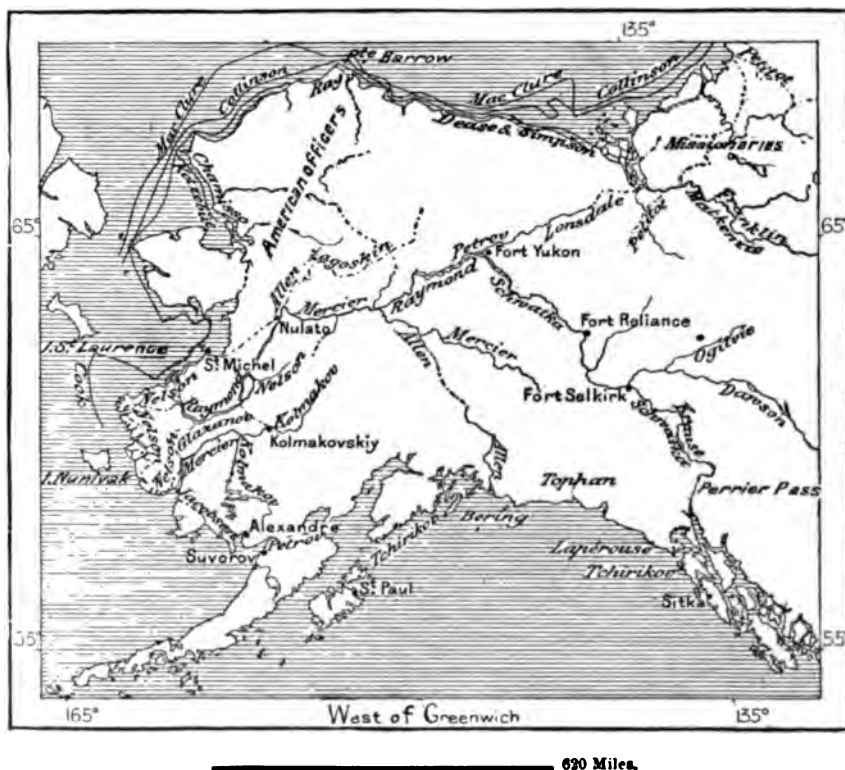
VIEW TAKEN ON THE COAST OF ADMIRALTY ISLAND, ALASKA.



well as the Kuskokvim (Kuskoquin), on the banks of which he erected the stronghold of Kolmakovst over 240 miles from the ocean. In 1832 Glazunov, also a half-breed, traversed the low-lying country between the Lower Yukon and the Kuskokvim, and in 1838 the station of Nulato was founded at the head of the lower course of the Yukon. Zagoskin's expedition, begun in 1842, surveyed all the western parts of Alaska as far as the Koyukuk basin. This was the most important and most scientific exploration carried out by the Russians in the interior of the "American Siberia." Some excursions of less consequence, completing the network of Russian itineraries in this region, are figured on an atlas published in 1842 by the "creole" or half-breed Terentiev at Sitka in 1842.

Fig. 44.—CHIEF ROUTES OF ALASKAN EXPLORERS.

Scale 1 : 22,000,000.



Although the rulers of Alaska had reserved to themselves the exclusive right of exploration, the Americans engaged on the construction of the international telegraph across Bering Strait (a work interrupted in 1867), took some part in the geographical survey of the land. But after the cession of the territory, being desirous to ascertain the real value of their purchase, they took its scientific exploration vigorously in hand. It was visited in various directions by the naturalist, Dall, during the years 1866-68; Petroff prepared statistical returns of the tribes; Raymond, Schwatka, and Everett followed the course of the Yukon, which is now well known from its source to its mouth; Allen surveyed its two largest tribu-

taries, the Tanana and the Koyukuk, and also ascended the Copper River nearly to its source, and crossed the chain of the Alaskan Alps. Mercier, a Canadian, who lived over seventeen years in the country, where he founded several stations, ascended the Tanana to its headstreams, and penetrated north of the Yukon and beyond the Arctic Circle into the Upper Nunatok basin.

Numerous miners have made their way over the Rocky Mountains down to the plains of British North America, and naturalists such as Krause, Dawson, and Ogilvie, have followed in their track. The survey of the southern and western districts is thus being completed, and the only regions still unexplored are those of the north-west and north-east. Here the junction has not yet been effected between the short expeditions undertaken by Ray about the meteorological station at Barrow Point, and the surveys of the Koyukuk, Nunatok, and Kovak severally executed by Allen, Mercier, and Stoney. The geographical nomenclature becomes more and more English in the interior, while on the seaboard most of the Russian names have been preserved. Amid this diversified terminology—English or Russian, Eskimo or Indian—we occasionally come upon places bearing French names. These are due to the Canadians of pure or mixed blood, to whom the Americans are also indebted for the term "Bostonians" till recently current in Alaska and British Columbia as the general designation of all citizens of the United States.

THE SOUTH ALASKAN ALPINE COASTLANDS AND ISLANDS.

The South Alaskan coast range is not entirely comprised within United States territory even on its seaward slope, for the conventional line of demarcation certainly falls beyond the main ridge of this range. The more or less parallel chain skirting the Pacific shore, as far as the Mount St. Elias group, may be said to have its chief development in British Columbia. Alaska itself is traversed only by secondary ridges flanked here and there by lateral spurs, mostly of low elevation. The greater part of the crests do not exceed 2,000 feet, as far as and beyond 57° latitude, where the region of great glaciers begins with that of Patterson, and which, according to Elliott, comprises about 5,000 altogether. But more lofty eminences occur in the neighbouring islands. Here Mount Calder, in the north of Prince of Wales Island, was in eruption when these waters were visited by Antonio Maurelle in 1775, but since then appears to have been quiescent. Mount Edgecumbe, the San Jacinto of the early Spanish navigators, which occupies an islet facing Sitka on the west side of Baranov Island, has an elevation of 2,850 feet, and from the form of its truncated cone it is evident that it was formerly at least one-third higher. It has a circuit of over a mile, and was emitting flames at the time of Lutké's voyage in 1796.

These southern shores of Alaska are profoundly indented by fjords, which ramify into endless branches and secondary channels. No section of the north American Pacific coast presents a similar labyrinth of straits, severing from the mainland some 1,100 islands of all sizes, which appear to have at one time formed

part of the continent, or at least been connected with it by glaciers. South of Alaska the broad Dixon Strait, between Prince of Wales and the Queen Charlotte Archipelago, interrupts the maze of islets, and here the zone of fjords is much narrower, although still continued southwards to the entrance of the Juan de Fuca passage, where it abruptly terminates at the headland of Cape Flattery. North of Cross Sound the shore, although still indented, is far more regular than in South Alaska, and beyond the Peninsula and Aleutian Islands it is disposed in long slightly curved lines and massive peninsulas. Along the Arctic seaboard the shore-line stretches west and east without any prominent headlands, and here the deepest indentations are fringed with low sandy ridges.

The ramifying fjord-like formations on the South Alaskan coast are evidently due to the structure of the mountains, which have become folded and diversely ruptured, producing a labyrinth of faults and fissures, which were formerly filled with glaciers, and which are now flooded by the sea branching off into a thousand straits and channels. The complexity of these islands, the largest of which have retained the names given to them by the Russian navigators of the last century, is sometimes designated by the general appellation of the Alexander Archipelago. Nevertheless, Prince of Wales Island, largest of the group, and its neighbour Revilla-Gigedo with some others, recall the share taken by the English and Spanish mariners in the work of discovery. Between the islands and the mainland a sheltered navigable highway is offered to the coast steamers by the intervening passages which are of analogous form to the fjords penetrating inland. Their average depth is enormous, that of the Tungas Straits at the southern entrance of the Alaskan fjords exceeding 400 fathoms.

The range of lofty mountains begins immediately beyond the Archipelago, towering above the coast which from this point trends in nearly a straight line north-westwards. Mount Lapérouse rises to a height of 11,300 feet in the terminal peninsula which is limited on the east side by the fjord of Glacier Bay. Beyond it follow Mount Crillon nearly 16,400 feet high, and Mount Fairweather, which despite its name is wrapped in fogs for over half the year. The copious rains and snows falling on these mountains and their offshoots have given rise to extensive glaciers overflowing into all the divergent valleys. On the east slope these glaciers merge together in enormous streams which descend to the shore and even advance beyond the coastline, discharging seawards small crystalline blocks, which travellers compare to flocks of swans swimming on the blue waters.

North of Cross Sound the highlands develop a vast amphitheatre round the moving ice-field which advances in white promontories down to the deep waters, and in many places the base of the glittering escarpments may be followed for several miles. Of all these glaciers the largest is the Muir, whose terminal wall, 250 feet high, plunges into water 516 feet deep. Its discharge is estimated by G. F. Wright at about 140,000,000 cubic feet per day during the month of August,* which is equivalent to a river sending down about 1,580 cubic feet per

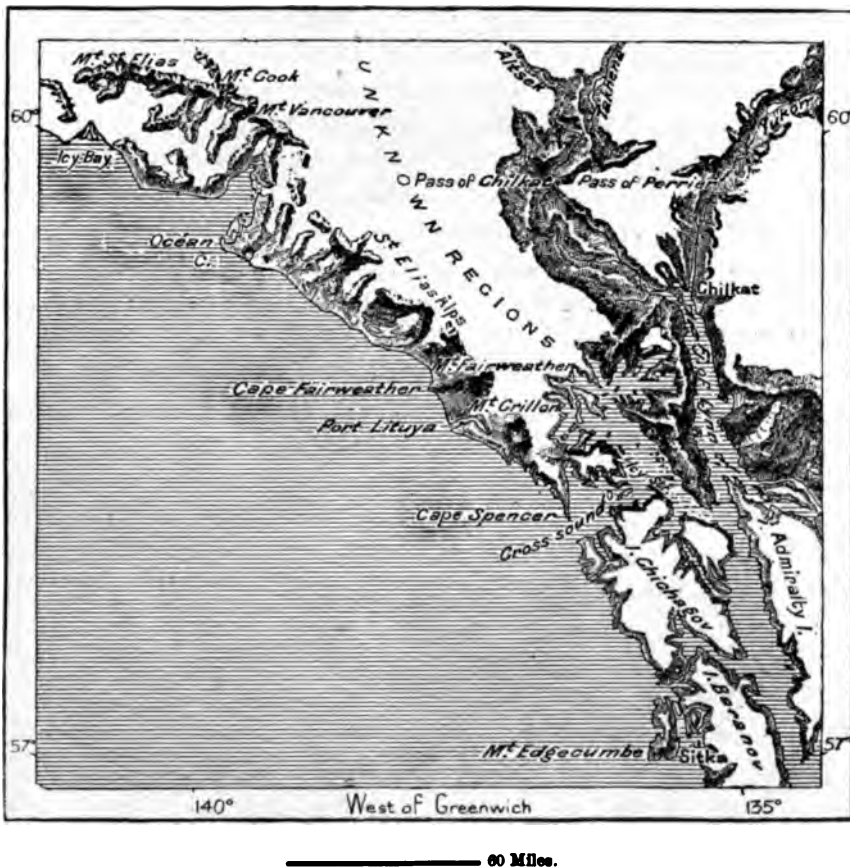
* *Proceedings of the Royal Geographical Society, February, 1897.*

second. The whole of this region is an Alpine world, a "marine Switzerland," whose base is encircled by straits and inlets instead of verdant valleys. These natural marvels already attract hundreds of tourists from California, Oregon, and Canada.

Mount St. Elias, probably the culminating point of the North American continent, belongs to the same coast range as Mounts Crillon and Fairweather. It is girdled by glaciers above which its sharp pyramidal peak rises to a height of 19,100 feet.* The "Great" Mountain, as it is called by the natives, is perfectly

Fig. 45.—ST. ELIAS RANGE.

Scale 1 : 4,000,000.



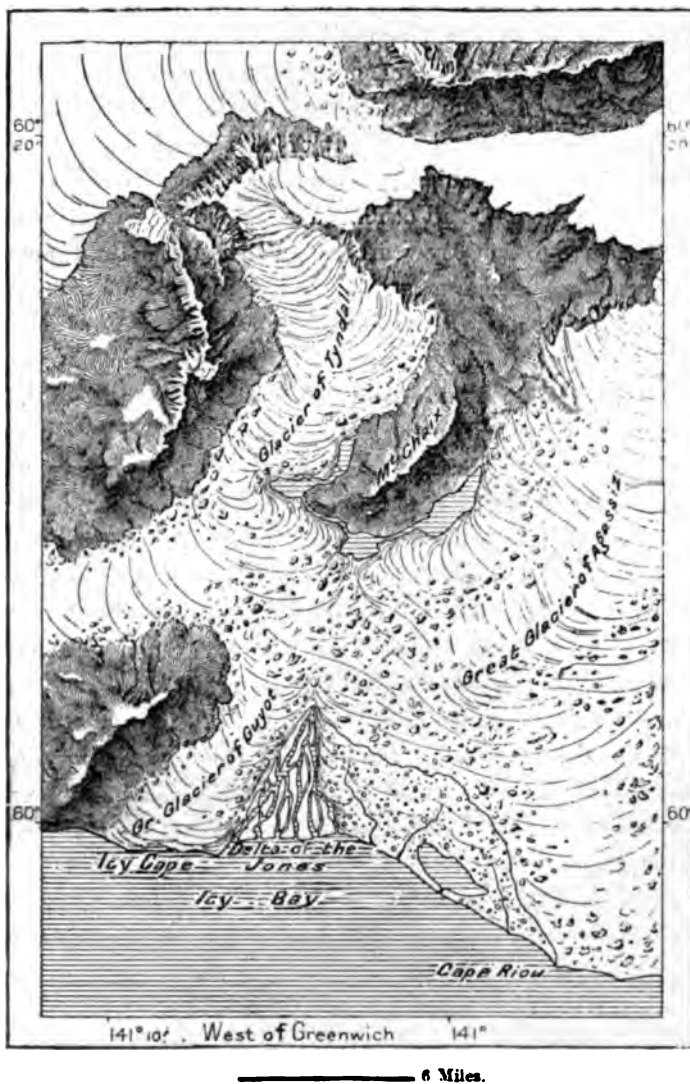
regular, at least on the three sides which alone have as yet been seen by observers. Ridges of ice sparkle on all the prominences, and here and there crystal offshoots project above the precipices. Below the escarpments, about half-way up its flank, a broad cirque is seen to open in the form of a crater, which perhaps without sufficient reason is supposed to be an extinct cone. At the foot of the outer talus of this chasm, which is now filled with ice, the glacial stream winds down the slopes

* Or 19,500, according to Lieutenant Allen.

with an average breadth of about six miles between snowy heights, every gorge of which sends a smaller contribution to the Tyndall glacier, as the main stream has been named. The waters collected in its lower depths swell up at its base above enormous moraines; here are formed temporary lakelets which are strewn with floating blocks of ice, but which soon escape through lateral fissures.

Fig. 46.—SOUTHERN SLOPE OF MOUNT ST. ELIAS.

Scale 1 : 400,000.



The glacier itself also seems to disappear at the point where the slopes begin to gradually fall off in the direction of the sea; here are mingled in chaotic confusion heaps of shingle and boulders, shale, slate, granite, quartz, porphyry, trachyte, basalt, amid which are here and there visible the layers of blue ice.

foaming torrents or sheets of smooth water. Lower down its extensive moraine formation, which covers the glacier for a width of about nine miles, is itself clothed with a layer of earth, where grows a dense forest of spruce, alder, willows, birches, and maples, while the whole mass of stones, clay, brushwood, and trees, is borne along at an extremely slow rate by the glacier flowing beneath. The accumulated forest-clad débris, thus advancing seawards, at last overwhelms the coast forests themselves, the aspect of nature changing from year to year with the progress or retreat of the glacier, the shifting refuse, floods, crevasses, or sudden eruptions of the underground stream. The Yahtsé-tah, or Jones, as this river has been renamed, plunges, "broad as the Thames," into the hidden galleries of ice and moraines, and after a sub-glacial course of about eight miles reappears in countless channels winding between the mud and sand flats of a broad delta.

Alpine climbers have reached a height of 11,461 feet on a steep ice-ridge in the amphitheatre of secondary summits encircling the crater-like cirque of the St. Elias. This mountain surpasses all others on the globe in the extent of the ice and snow fields, which have to be traversed between their lower limit, about 3,000 feet above sea-level, and the terminal crest. In fact, at some points it might be possible to ascend the whole way from base to summit on an uninterrupted sheet of ice, for the Agassiz glacier advances to the water's edge, terminating in sparkling white cliffs 150 to 300 feet high, which descend 650 feet on the marine bed. One of the "dead" glaciers, that is, covered with earth and shingle, sloping north-westward in the direction of Yakutat Bay, has a surface of at least eighty square miles.*

Westwards, Mount St. Elias is continued by a ridge which falls rapidly, but whose crests none the less present a superb aspect, and send down glaciers of considerable size. One of these falls precipitously from a lateral valley as if to bar the course of the Copper River; but the ice itself is visible only through the crevices, the lower part being almost everywhere covered with shingle, earth, scrub, and even trees. A little farther on the deep inlet of Prince William Sound interrupts the coast range, which is only indicated at intervals by the chain of islands half closing the entrance of the sound. But beyond this break the orographic system reappears in the Kenai range, which is continued seawards by the large Afognak and Kadiak islands, and still farther west by a few islets running parallel with the Aleutian Archipelago.

The Shugach (Chugach) Alps, whose snowy amphitheatre, 7,200 feet high, encircles the northern bend of Prince William Sound, are connected by spurs with the St. Elias chain, and the volcanic group east of the Copper River may be regarded as forming part of the same system. Mount Wrangell, the highest peak in this region, has often been described as rivalling the St. Elias in height; but it would appear to fall considerably below 18,000 feet,† while its neighbour, Mount Tillman, is about 1,000 feet lower. It is certainly a volcano, and although ice-capped like the Kamchatka cones, its crater emitted dense volumes of vapour in

* Harold W. Topham, *Proceedings of the Royal Geographical Society*, July, 1889.

† Yet Lieutenant Allen asserts that it rises 18,400 feet above the forks of the Copper River, which are themselves 2,000 feet above the sea. This would make it 20,400 feet or 1,000 higher than St. Elias.

1884. Mount Drum is also of igneous origin, though now extinct. Other neighbouring summits may also be of volcanic formation, for the banks of all the headstreams of the Yukon present thick layers of scoriæ, which would seem to have been ejected by Wrangell and the surrounding mountains. Immediately above a gorge of the Copper River rises the "Spirit Mountain" (2,800 feet), so called by the natives, who occasionally hear the muffled roar of the evil spirits within its recesses. West of the Atna River the crests of the hills encircling the Kenai Peninsula still maintain an altitude of from 10,000 to 12,000 feet.

The Alaskan Alps, which form a curved prolongation of the Rocky Mountains properly so called, are still to a great extent very little known. At the Perrier Pass, between the Chilkoot Sound and the source of the Yukon, they are little over 4,000 feet high, while the Miles Pass, lying much farther west between the Copper and Tanana valleys, falls, according to Allen, to less than 3,100 feet, though the neighbouring summits are double that height. The depressions of the rugged plateau, which here forms the waterparting, are flooded with small lakes or tarns. None of the peaks of the Alaskan Alps appear to attain 10,000 feet; but although less elevated than the southern coast range they are much more regular, developing a vast curve, whose main axis runs parallel with the south coast and the Yukon valley.

THE ALASKAN PENINSULA AND ALEUTIAN ISLANDS.

Towards the neck of the Alaskan peninsula, the range skirts Cook's Inlet at no great distance from the superb Iliamna (Ilyamna) volcano, by the Spanish navigator Arteaga named the "Wonderful." Its highest peak rises to a height of 12,000 feet; but the crater, which occasionally emits vapours, stands at a much lower elevation. Nevertheless Petroff failed to reach its rim owing to its steep sides and dangerous ravines, swept by avalanches of snow. Near Iliamna rises the less elevated Mount Redoute, a perfectly regular mass of scoriæ, which was emitting smoke when seen by Wrangell in 1819. These two cones form the eastern limits of the long Alaskan peninsula, the middle of which is marked by the superb Veniaminov with its encircling cortège of snowy peaks. Veniaminov was in continuous eruption during the years 1830—40.

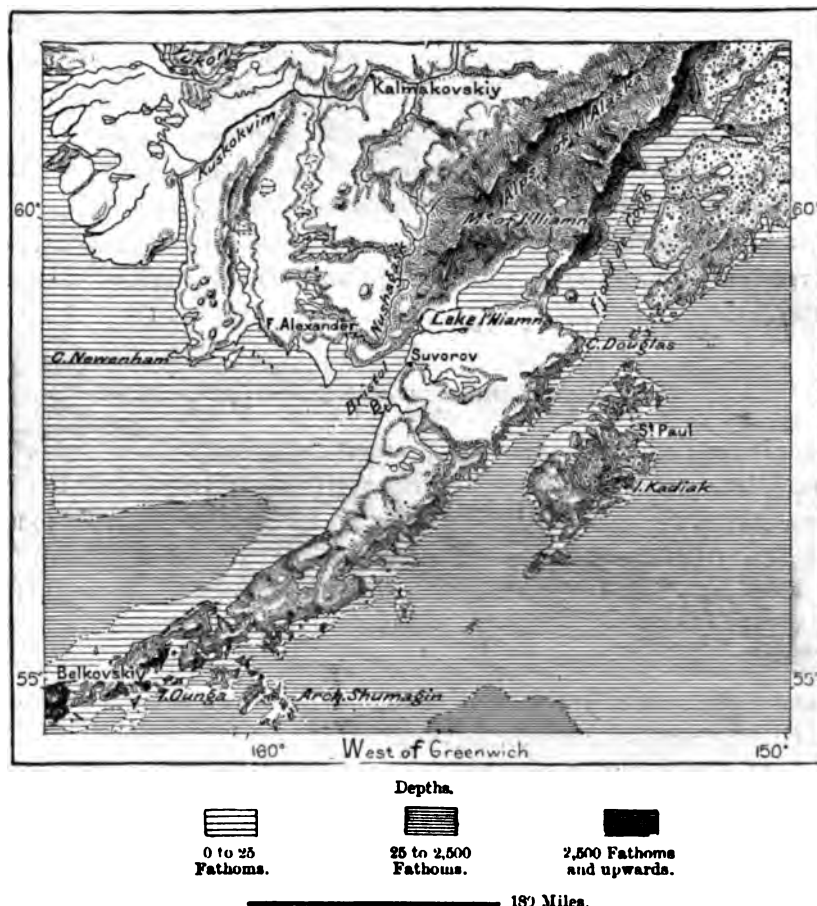
Beyond this point begins the long chain of the Aleutian Islands, which sweep round from the north to the south-west and then to the west, developing a regular arc of a circle with a radius of about 900 miles. In no other part of the world are seen two systems of terrestrial prominences presenting a greater analogy of forms and origin than do the two volcanic chains of the Aleutians prolonging the American peninsula of Alaska, and the Kuriles, continuing the Asiatic peninsula of Kamchatka. The resemblance between these insular groups is extended even to the bed of the ocean. Both enclose relatively shallow seas on their concave northern sides, while on the opposite side they plunge into the abysmal waters of the Pacific. Nevertheless, within the Aleutian range occur depths of 750 and even 1,000 fathoms. The whole chain is divided into the four secondary groups

of the Fox, Andreanov, Rat, and Near Islands, the last so named from their proximity to Siberia.

Although lying on the same fault in the terrestrial crust, the peninsular Alaskan range, sometimes designated by the name of Tchigmit, is intersected at intervals by very low sills or portages, the *perenossi* of the Russians, which, in fact, are utilised by the boatmen for transporting their canoes from one slope to the other. These

Fig. 47.—HORN OF ALASKA.

Scale 1 : 9,000,000.



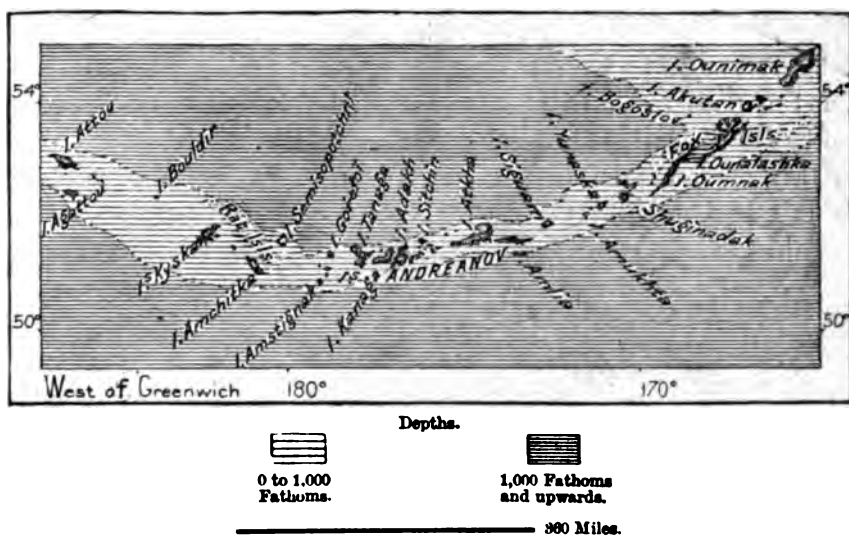
gaps, which follow throughout the whole length of the peninsula, represent the straits formerly connecting the corresponding fjords on the north and south coasts. Towards the neck of the peninsula the two opposite fjords of Cook's Inlet and Bristol Bay are already half connected by an extensive lake, bearing the name of the neighbouring Iliamna volcano. Farther on follow other lakes, each flooding one of the transverse sections by which the long peninsular horn is divided into distinct fragments. All these lacustrine basins send their overflow northwards to the

Bering Sea, towards which the mountains slope gently, while presenting precipitous escarpments to the deep southern waters.

Although occurring at long distances from each other, one or other of the Alaskan or Aleutian cones is nearly always in eruption, and during the historic period over thirty of these cones have been the scene of underground disturbances. Vapours and lavas are often ejected by Mount Alay at the neck of the peninsula, and Pavlosky, towards the extremity of the horn, is also pierced by an active crater. In 1826 Chichaldinsk, the highest volcano in Unimak Island (8,700 feet), ejected dense clouds of ashes, which changed day into a terrible night, partly destroying the animals on the island and neighbouring lands. The following year a second eruption took place, after which a second crater was opened to the east of the old one. Makushin, in Unalashka (5,000 feet), is one of the most active in

Fig. 48.—ALEUTIAN ISLANDS.

Scale 1 : 15,000,000.



emitting vapours, although no eruption has taken place during the present century.

New islands occasionally make their appearance in the Aleutian waters, as, in 1796, when Bogoslov, or St. John the "Theologian," rose about 100 feet above the surface and gradually increased in size till 1825, when it formed a peak over 420 feet high, with an oval base about 5 miles in circumference. Since then it has again been reduced by erosions to little over 250 feet; but in 1883, the year of the Krakatau outburst, a second cone, the Grewink volcano, appeared 220 yards to the north-west of Bogoslov. At the same time Mount Augustine, near the entrance to Cook's Inlet, became convulsed, and the disturbance was followed by the appearance of another islet. Thermal springs and mud volcanoes occur in many parts of the Archipelago.

The two Pribilof islands, Saint Paul and Saint George, as well as Saint Matthew farther north, and the twin island of Saint Lawrence in the middle of the Bering Sea, are also of volcanic origin; but all the craters are obliterated, except that of Otter Island, near Saint Paul, and Pinnacled Rock, south of Saint Matthew, from which vapours are incessantly ejected at a height of 1,500 feet above the sea. On the American side of the strait the small headlands projecting into Norton Sound, north of the Yukon delta, are formed of old streams of black basalt. The insular peaks of Kusilvak (2,000 feet), the five Nordenskiöld crests (1,000 feet), now encircled by alluvia, and the heights of Cape Newenham (2,460 feet) were also formerly volcanoes.

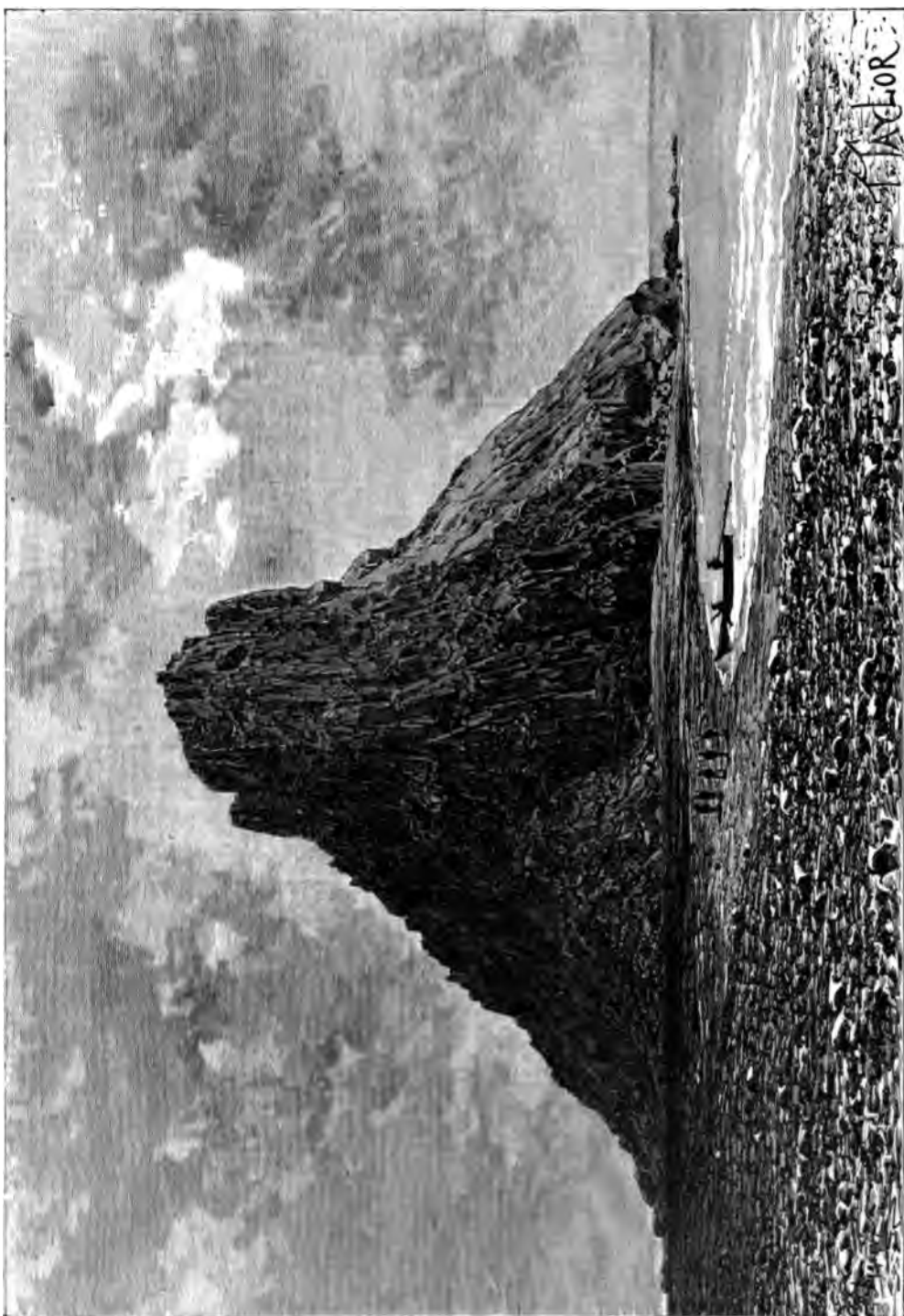
THE INTERIOR OF ALASKA.

The inland ranges running north of the Alaskan Alps have been surveyed only at a few points, and their general trend has not yet been determined. Some belong to the paleozoic formations, others to chalk and even to tertiary times, and these abound in fossils and especially in impressions of foliage. At several points along the coast observers have discovered deposits of lignite, and rich beds of coal are found at Cape Lisburn on the shores of the Frozen Ocean. These were utilized by Hooper during his Arctic explorations in 1880.

As they approach the Bering and Arctic waters the Alaskan mountains appear to spread out like the ribs of a fan, and here they are certainly less elevated than in the south. The Rumiantzov chain, between the Yukon and the Polar Sea, would seem nowhere to exceed 4,000 feet, so that the Alaskan system taken as a whole appears to fall gradually in the direction of the north and north-west.

Despite its higher latitude, North Alaska has no glaciers comparable to those of the southern region. The difference is due to the absence in the north of lofty mountains with vast catchment basins and long valleys, where the frozen streams might wind down the slopes like the running waters. Nevertheless, these northern glaciers descend like others from the uplands of the interior towards the coast; only their motion is extremely slow, and in certain places they may even remain stationary owing to the lack of incline, or the absence of pressure from above. During his voyage on board the *Rurik* along the shores of the sound now bearing his name, Kotzebue noticed with surprise that a promontory covered with vegetable humus and an abundant growth of flowering plants consisted of a long glacier fissured by deep crevices.

On the same sound Seeman and his companions on the *Herald* made a similar, but even more remarkable discovery, that of a fossil glacier higher than the surrounding hills, and continued along the coast in the direction of the east at an elevation of over 650 feet. As afterwards ascertained by Dall and other explorers, this mountain of ice is completely covered with a layer of mud several yards thick, supporting a vegetation of willows, herbaceous plants, mosses, and lichens. Numerous discoveries of bones showed further that the underlying ice must have



OLD BOGOSLOV PEAK, ALEUTIAN ISLANDS



been formed, not centuries but ages ago, for amongst the remains were those of the mammoth and of the horse, long extinct in America.

According to Dall and others, there are no traces of glacial action west of the Rocky Mountains greatly exceeding the present limits of the frozen streams, and it is remarkable that no erratic boulders are met on the plains near Kotzebue Sound. But in South Alaska, and especially in Lynn and Glacier Bays clear proofs occur of shrinkage. Some marine islands are certainly old moraines, and above the Muir glacier rise high striated cliffs, which were at one time entirely covered by the ice. George W. Dawson even endeavours to show that the whole space between the Rocky Mountains and the coast ranges was formerly filled by a vast icefield with a northern trend.

THE ALASKAN RIVERS.

A few streams ice-bound in winter flow in summer to the Arctic Ocean, cutting a channel through the floe-ice which here fringes the coast. Such are the Colville (Nigalek-kok), the Meade, the Nunatok (Noatak), and the Kovak, the last two falling into Kotzebue Sound. But south of these streams, which are seldom navigable, the coast is reached by the Yukon, the most copious of all American rivers flowing to the Pacific, and one of the largest in the whole world. Petroff and other American geographers assign it a volume one-third greater even than that of the Mississippi, which would imply a mean discharge of about 740,000 cubic feet per second. This estimate, however, does not appear to be based on accurate measurements, and it should also be remembered that in winter, when the Mississippi is overflowing its banks, the Yukon on the contrary is deprived of its affluents, which at times are frozen through to the bottom; hence its winter discharge represents but a very small proportion of its volume in summer. In any case the Yukon compares favourably in size both with the St. Lawrence and Mississippi, its length from the source visited by Schwatka to the mouth of its chief branch being no less than 2,000 miles, and the area of its basin about 400,000 square miles, considerably more than three times that of the British Isles. It is also entirely free from falls or rapids and accessible to steamers as far as British territory above the Lewis and Pelly confluence.

The region of the Upper Yukon was long known to the Canadian and Scotch trappers of the Hudson Bay Company; but they were unable to connect the course of the rivers frequented by them with that of the main stream, the chief artery of the whole of north-west America. The Yukon was first ascended in 1863 by the Russian trader, Ivan Lukin, to the British frontier, though the account of his journey was never published. The oldest authentic chart of the river within the present limits of Alaska, is due to Ketchum and Laberge,* servants of a telegraph company, who in 1867 pushed forward to Fort Selkirk, 380 miles beyond the conventional frontier. Then after the cession of Alaska to the United States, Raymond was charged with the official survey of the whole fluvial basin within the former Russian territory.

* Not *Leberge*, as the name of this Canadian is reproduced in all English works.

According to Schwatka the main headstream descends from the Perrier Pass (4,100 feet), so named in honour of the French geographer. Collecting its waters in Crater Lake on the opposite slope of the Chilkat Mountains near the Lynn Channel, the Takheena torrent, gradually swollen by numerous tributaries from

Fig. 49.—CHILKAT AND CHILKOOT BAYS.

Scale 1 : 660,000.



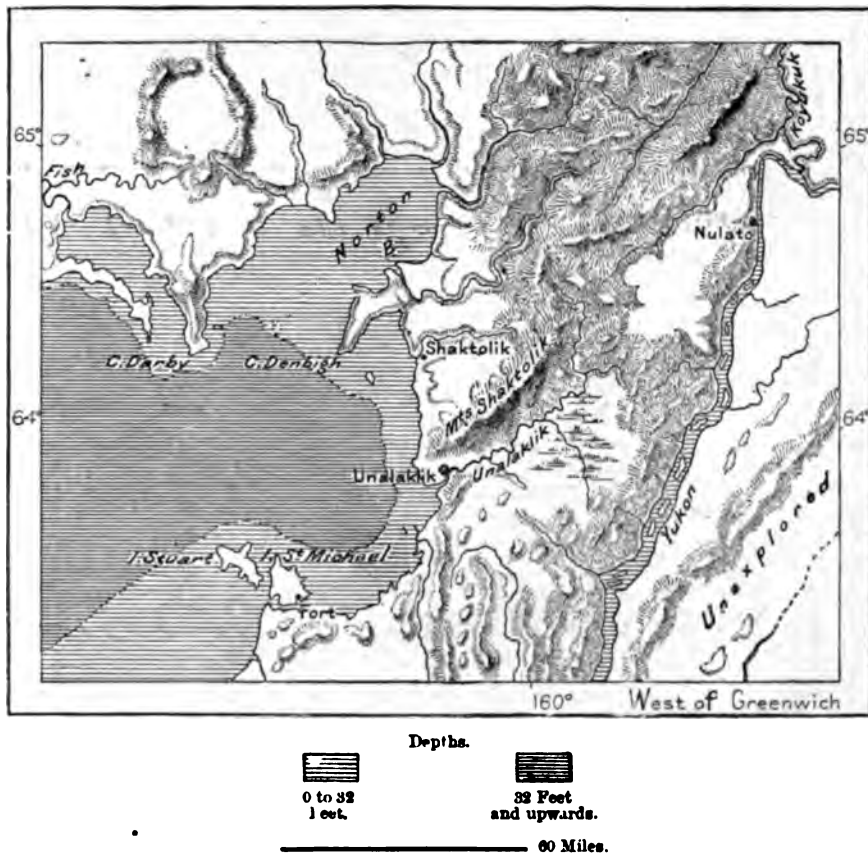
glaciers on both sides, rushes from fall to fall, from lake to lake, to the Alaskan frontier, where it is already a copious river. Below the only well-marked gorge occurring throughout the rest of its course, where its bed is narrowed to about 100 feet, the Yukon, or Lewes as it is here called, presents an uninterrupted navigable waterway of 1,800 miles to its mouth.* The Hotalinqua, one of its

* Fr Schwatka, *Along Alaska's Great River*.

farthest headstreams, rises far to the south in British Columbia, where its course lies through a long chain of lacustrine depressions connected by deep rocky gorges. Owing to the length of its valley Dawson considers that this branch should be regarded as the main stream.

Farther down the Newberry, the Big Salmon, or d'Abbadie, and the Pelly follow on the eastern slope; the last mentioned is sometimes designated as the Yukon throughout its whole course, on the information supplied by Campbell, who descended it in 1852. But Schwatka has shown that the Lewes is the true Yukon,

Fig. 50.—NORTON BAY, AND GREAT BEND OF THE YUKON.

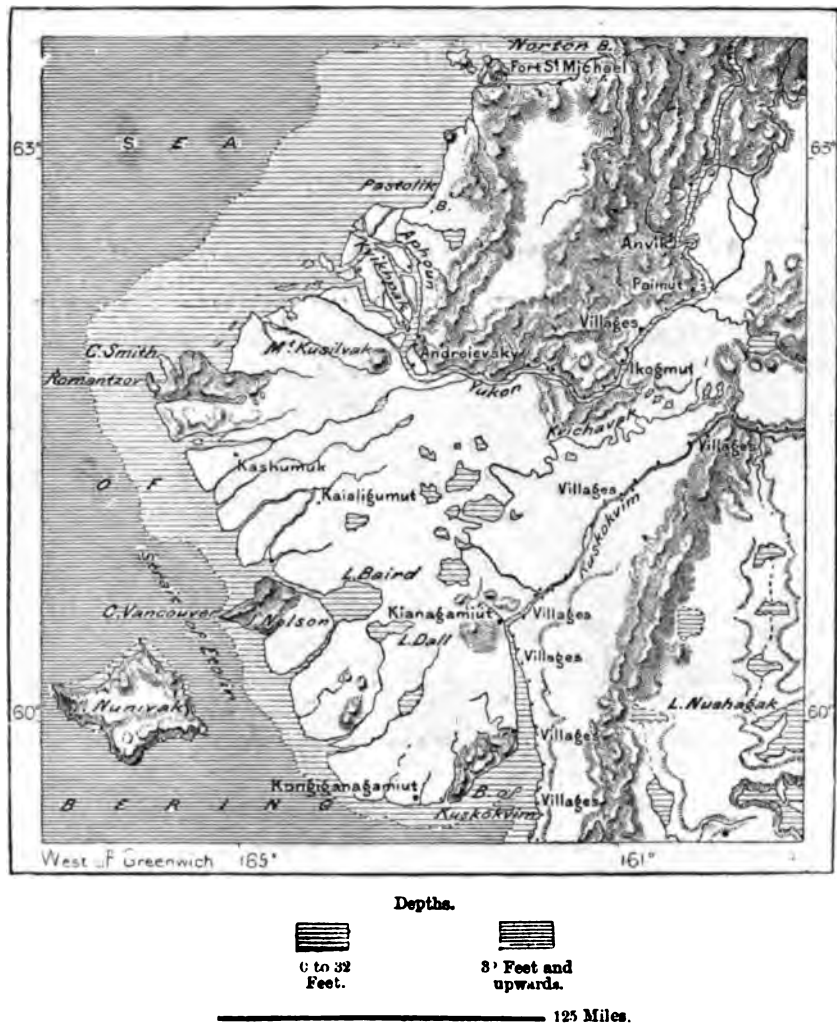


having a discharge about a fifth greater than the Pelly, 37,000 as compared with 29,000 cubic feet. Beyond the Rocky Mountains it is joined by the Stewart and the Porcupine, or Rat, whose valley runs parallel with the coast of the Arctic Ocean. At this confluence the Yukon is only about 400 feet above the sea, and here becomes navigable for steamers drawing 3 or 4 feet of water. Lower down it expands to a breadth of some miles and ramifies into numerous branches winding round islands and islets masking the real river banks. Lower down the branches converge in a single bed, where the navigation is somewhat obstructed by the so-called "Ramparts." But beyond this rocky gorge the stream again

expands, and here tends to encroach on the right bank in accordance with the law regulating the course of large rivers in the northern hemisphere. Here also the Yukon is joined by the Tanana, its largest affluent, which was ascended for the first time in 1848 by Mercier as far as the Tautot confluence, 150 miles from its mouth.

At the junction of the Koyukuk, another large tributary from the north-east, the Yukon, here 2,800 yards broad, bends round to the south-west, thus coming

Fig. 51.—YUKON DELTA.
Scale 1 : 4,500,000.



within 30 miles of Norton Sound, with which it is connected by an easy portage. Below the isthmus the Yukon continues its south-westerly course, and then trends to the west and north before ramifying into the numerous branches of its delta. Although the mainstream was long known as the Kvikpak, from the native name

of the middle branch, navigation is confined to the Aphun, or northern branch, which has an average breadth of 1,600 yards, winding for 40 miles through a willow-fringed bed to an open estuary half obstructed by a bar. The Kvickpak, Kusilvak, and all the other branches with their lateral channels are similarly separated from the sea by sandy bars, none of which are flooded by more than 10 feet of water. The sea itself is here endangered by alluvial banks, and so shallow that clear water 30 or 40 feet deep scarcely anywhere occurs 60 miles off the shore. In summer and autumn the river rolls down a vast volume of water which melts the floe-ice and tempers the climate along the coast. But the floating ice becomes again united in winter and spring, forming a cordon of islets round the delta. Fluvial ice also obstructs the delta during this season, and one year persisted so long that the salmon in vain attempted to ascend the channels.

Although really a very large watercourse, the Kuskokvim, compared with the Yukon, is regarded only as a secondary stream. It even in some respects belongs to the same fluvial system, for in its lower reaches it approaches the Yukon, and traverses the same alluvial plains. Both rivers are connected by lakes or lagoons alternately dry and flooded, so that the traveller is often uncertain which fluvial basin he is traversing.

On the southern slope of the coast range the largest stream flowing entirely within Alaskan territory is the Copper River (Atnah), which has been ascended by Allen to the head of the navigation below the easy portages leading to the upper course of the Tanana. After describing a great curve to the north, west, and south, round the highlands dominated by Mount Wrangell, the mainstream is joined from the east by Chittynia, which is the true "Copper" River. One of its affluents sends down such a quantity of the metal in solution that salmon are unable to live in its yellow waters. Hence Allen was not justified in applying the name of Copper River to the section of the mainstream which lies above the Chittynia confluence. A few miles below this confluence the united streams plunge into Wood's Cañon, one of the wildest gorges in the whole of America. This tortuous chasm, nearly 3 miles long, is contracted in some places to scarcely 120 feet between its vertical basalt walls; but at certain sudden turns the fissure expands into broad basins without any visible issue. The gorge is enclosed by rocky terraces from 100 to 500 feet high, black and almost destitute of vegetation. Here and there a few stunted shrubs are seen on the cliffs, and from an overhanging ledge a broad rivulet is precipitated into the stream, though for the greater part of the year the fall is a solid crystalline mass.

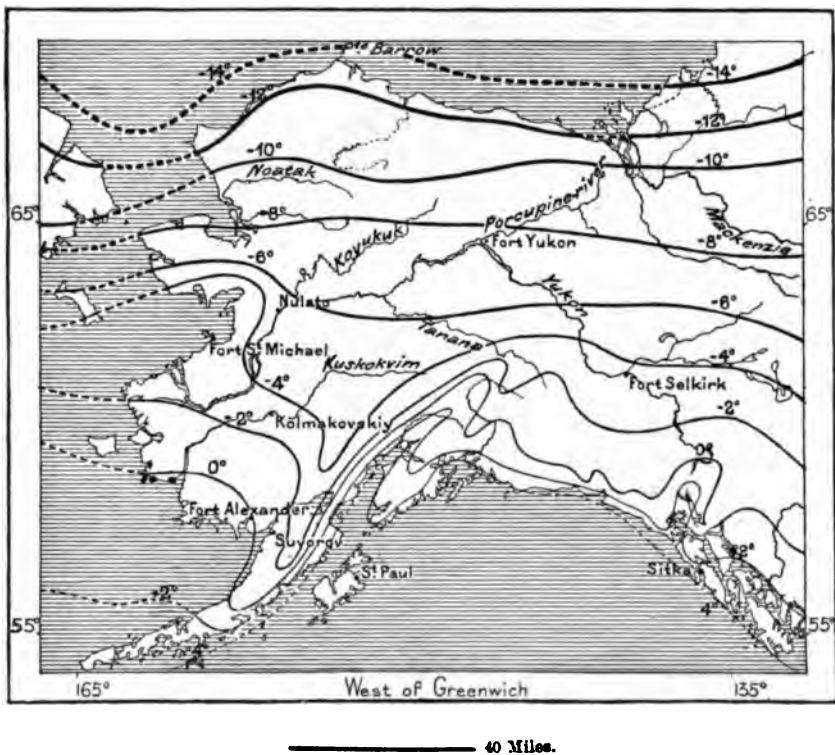
Below the gorge begins the lower course of the Copper River, which, after winding to the west of the chain terminating in the "Mountain of Spirits," receives contributions from the surrounding glaciers, and ramifies into several channels intersecting the alluvial plains of its delta. Occasionally the stream is partially blocked by the projecting glaciers, greatly endangering the navigation. The Taku, Stikine, and other rivers flowing to the southern fjords belong to Alaska only in their lower course, nearly the whole of their catchment basins being comprised in British territory.

CLIMATE OF ALASKA.

The character of the Alaskan climate is sufficiently indicated by those rivers which send down such enormous quantities of ice to the ocean, and which are themselves ice-bound for eight months in the year. The central depression traversed by the Yukon partly corresponds with the natural parting line between the two sections of the country, draining one to the Arctic, the other to the Pacific waters. At one point near Fort Yukon the Arctic circle itself touches the

Fig. 52.—ISOTHERMAL LINES OF ALASKA.

Scale 1 : 20,000,000.



course of the river, and after intersecting the tundras crosses Kotzebue Sound, leaving Bering Strait entirely within the temperate zone. Hence the climate of the northern section resembles that of the Polar Archipelago. During Ray's residence at Barrow Point the glass never rose to 64° F., while it often fell to -13° . A temperature of -52° has even been recorded, but the region south of Bering Strait is much warmer, the mean heat being several degrees higher than under the corresponding latitude on the east side of the continent.*

This comparative mildness is due to the disposition of the mountain ranges,

* Contrast between the west and east coasts of America under the same latitude :—
 Sitka, on the west side, 57° Lat. . . . 41° F. mean temperature.
 Nain, on the east side, $57^{\circ} 10'$ „ . . . 26° „ „

which shelter the southern coastlands from the polar winds. On the other hand, the great curve of the peninsula of Alaska, continued westwards by the Aleutian Chain, deflects towards Asia all the cold waters from the Frozen Ocean, while the tepid stream from Japan penetrates freely into all the bays and inlets along the southern seaboard. The winter snows are soon melted, and the harbours are covered only by thin sheets of ice, so that vessels are able to ride at anchor throughout the year. But if the winters are mild, the summers are moist and relatively cold. The sky is mostly overcast by the clouds gathered up by the prevailing south-east winds, and precipitating their contents almost incessantly.*

Being interrupted by numerous breaches, the mountainous Aleutian Chain receives a slighter rainfall than the coast-ranges sweeping round in the direction of British Columbia. The precipitation is heavy, especially on the coastlands which begin at St. Elias, and which lie at a right angle with the winds and currents of the north Pacific, the annual rainfall here rising to several yards. Fort Tungal, the southernmost station in Alaska, is the wettest spot on the whole American seaboard, from Bering Strait to Tierra del Fuego. But on the opposite slope of the mountains, in the Tanana and Kuskokvim valleys, the climate assumes a more continental character. Throughout the interior of Alaska, the ground is permanently frozen below the surface, in some places to a depth of at least 30 feet. The moisture is thus prevented from filtering through, and the upper strata, even on the slopes of the hills, become swampy in the warm season. On the other hand, the carpet of mosses and lichens covering the ground arrests the effect of the solar rays in the depths of the sub-soil.†

The main current of the Japanese "Black Stream" strikes the southern extremity of the Alaskan seaboard, here ramifying into two branches, one of which flows south-eastwards along the Oregon and Californian coasts, while the other turns back along the shores of Alaska and the Aleutian Chain. Within this vast semicircle, the water has a mean temperature of 48° to 50° F., that is, a few degrees higher than the neighbouring coast. But north of the Aleutians, the mean temperature of the oceanic waters diminishes rapidly, though shifting with the seasons according as the various secondary currents predominate in the Bering Strait. According to most navigators, the southern waters prevail during the greater part of the year; but throughout the winter a glacial north-west wind penetrates into the strait and is accompanied by large quantities of water which usually follow the Asiatic coast, while the more tepid currents turn back along the American coast. Thus is produced a sort of eddy, which is revealed by the

* Rainy days at Sitka, 285 in the year (Dall).

† Meteorological conditions at various points of Alaska:—

	N. Lat.	Mean Temp.	Extremes		Rainfall.
			of Cold.	of Heat.	
Barrow Point . . .	71° 18'	— 4° F.	— 52° F.	+65° F.	1 inch.
Fort Yukon . . .	67° 12'	+15°	— 36°	+63°	—
St. Michael . . .	63° 27'	+24°	54°	+75°	2 (P)
Sitka . . .	57° 3'	+41°	— 4°	+75°	81
Fort Tungal . . .	54° 46'	+44°	0°	+91°	84
Anchushka . . .	53° 29'	+36°	0°	+77°	4

drift ice, but which disappears when the Strait is annually closed by the ice-pack. In the inlets along both sides of the horn of Alaska, the tides rise to a great height, over 50 feet in the Kuskokvim estuary, and in Cook Strait forming a bore of 26 feet. In these waters the 'woollies,' or sudden squalls sweeping down from the surrounding uplands, are much dreaded by mariners.

FLORA OF ALASKA.

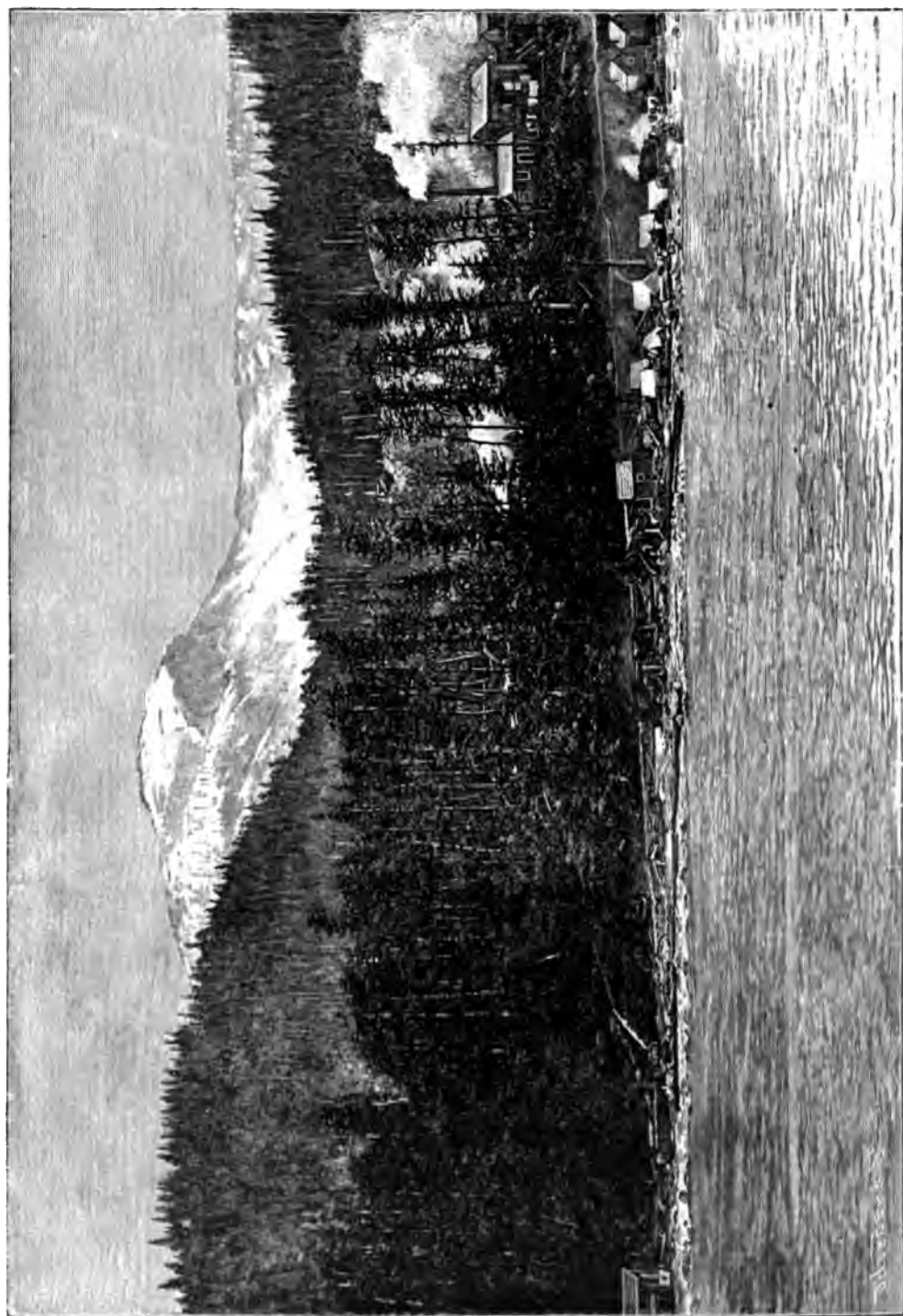
To the difference of climate corresponds a striking contrast in the aspect of the two seaboard facing one another on Bering Strait. The Asiatic side, washed by cold waters, is almost destitute of vegetation beyond mosses, lichens, or a few dwarf bushes in the sheltered places, while on the American coast flourish whole forests of shrubs, growing to a height of 20 feet, and yielding abundant crops of berries. In spring, the plains are diversified by the brilliant colours of flowering plants, and the terraces of Cape Lisburn, at the north-west angle of Alaska, look like a garden.* But the northern coasts, between Kotzebue Sound and the Mackenzie estuary, are completely destitute of trees, driftwood being the only timber known on this seaboard. Nearly the whole region extending north of the Arctic Circle is a mere stretch of marshy plains or tundras perfectly uniform in appearance, frozen or spongy according to the seasons, and thickly dotted over with argillaceous knolls a few yards high. To cross these dreary wastes, the traveller has to jump from knoll to knoll at the risk of falling into the intervening depressions and getting entangled in the matted roots of the herbaceous or woody vegetation.

North of the Yukon the willows and alders are mere scrub and grow not in continuous forests but in scattered clumps on the less spongy mounds and knolls. Even the Aleutian Islands have no forests of spontaneous growth, the only large trees being the firs or pines planted since the beginning of the present century. These trees have struck root, but do not germinate, and unless carefully protected the little woodlands of Amakuak and Unalashka must soon disappear. The herbaceous vegetation of this archipelago nowhere presents any Asiatic types; American in the east, it becomes purely Arctic towards the western extremity. The European clover thrives well in South Alaska.

Great forests, chiefly formed of conifers, begin with the semicircle of coastlands sweeping round southwards in the direction of British Columbia. The section of Kadiak Island facing westwards is still under grass, while the opposite side is already covered with timber, the parting line between the two zones corresponding with the difference in the atmospheric currents. The west is exposed to the cold Asiatic winds, the east to the gales from the American uplands, which blow with such fury that the trees, especially in the Alexander Archipelago, are all inclined in the direction of the west.† These southern forests, where the most valuable species is the yellow cedar (*cupressus nutkatensis*), are scarcely less

* Berthold Seeman, *The Voyage of the "Herald."*

† Seton Karr, *Alaska*.



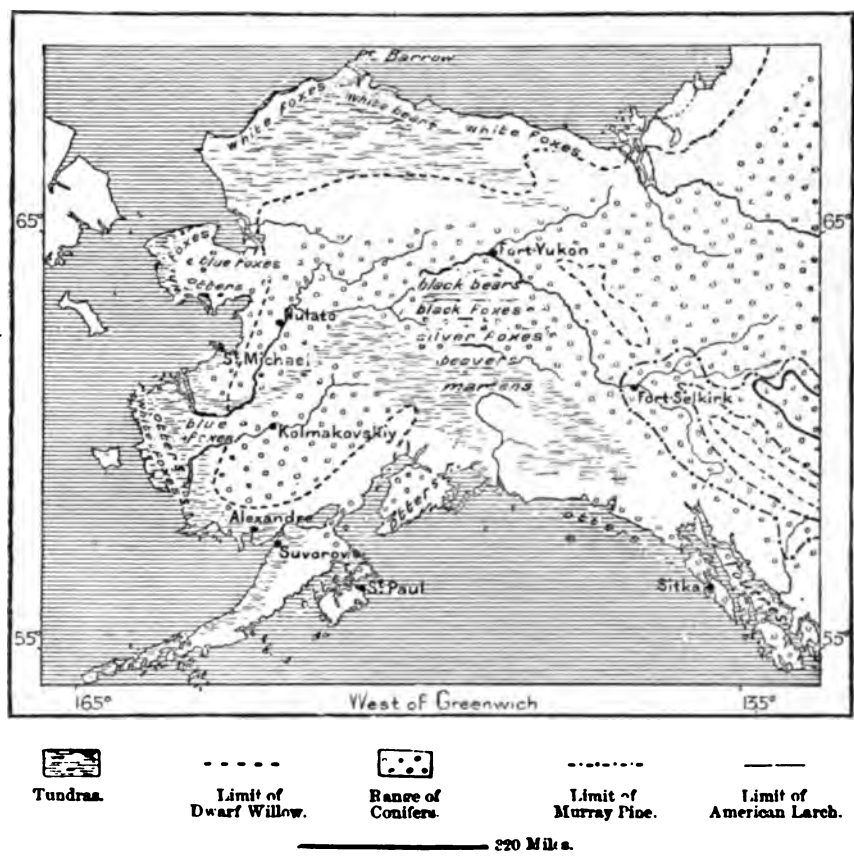
ALASKAN SCENERY VIEW TAKEN AT JUNEAU, DOUGLAS ISLAND.



difficult of access than the almost impenetrable thickets of the Amazonian and other tropical regions. The rains, prevailing for nine months in the year, foster an undergrowth of dank herbage concealing quagmires and sheets of water, decaying roots and snags dangerous to the wayfarer. The excessive moisture which stimulates vegetable growth, at the same time deprives the flowers of their

Fig. 53.—ZONES OF TREES AND RANGE OF CHIEF ANIMAL SPECIES IN ALASKA.

Scale 1 : 20,000,000.



fragrance, and the fruits of their flavour. The berries gathered in the neighbourhood of Sitka are almost tasteless.

FAUNA.

According to Dall, the Alaskan fauna comprises 62 species, all of which occur elsewhere—in Siberia, the Arctic Archipelago, British America, and the United States. The northern continuation of the Rocky Mountains forms the divide between the Canadian and Arctic types on the one hand, and those of Oregon on the other, both zones merging together towards the horn of Alaska (Dall). The white bear is met only in the regions facing the Polar Sea, black and brown bears

being common everywhere else, and especially in the Kinai peninsula and St. Matthew Island. The caribou wolf and the orignal are disappearing, as is also the tebai or "mountain sheep" (*haplocerus americanus*), a kind of chamois with long white fleece. The reindeer is found only in the wild state, although the Chukches, on the opposite side of Bering Strait, possess large herds of tame reindeer. The musk ox is extinct, but its remains occur along the banks of the Yukon.

Alaska is much frequented by the *rhodostethia rosea*, loveliest of the mew family, and distinguished by its peach-coloured plumage. On the other hand the mild summer climate of the southern woodlands attracts a Mexican species of humming-bird, which ranges to the north of Mount St. Elias (A. R. Wallace). No reptiles or batrachians are found anywhere in Alaska, except a solitary species of frog. The southern rivers teem with fish, and the salmon, smaller than that of Oregon, ascends the Copper River to the foot of the glaciers and snow-clad slopes. The remarkable houlakan (*thaleichthys pacificus*), found in all the coast rivers from South Alaska to the fjords of British Columbia, is so fat that the natives use it for lighting purposes, whence its English name of the *candle-fish*.

Although constituting the chief resource of Alaska, the families of seal and cetaceans frequent only a small number of islands, and can no longer be regarded as all belonging to the general fauna of this region. Nevertheless seals occur even in the inland lakes, and notably in the Iliamna basin (Petroff). The northern manatee (*rhytina Stelleri*) was completely exterminated towards the close of the last century; the whale, also formerly pursued by hundreds of American vessels in the Bering waters and even in the Arctic Ocean, has almost disappeared from the strait and taken refuge behind the floe-ice in the Polar Archipelago, returning to the open sea after the departure of the whalers.

INHABITANTS.

The few inhabitants of North Alaska, and even of the Aleutian Islands, are of Eskimo stock, and constitute one-half of the whole population. The Tinneh, who occupy the valleys of the Yukon and its affluents, are, on the contrary, true "Red Skins," while the Thlinkets and Haidas of the southern archipelagoes and coastlands belong to the same group as the peoples scattered along the shores of British Columbia and Vancouver's Island.

The Eskimo, who appear to be least affected by foreign influences, form wandering communities along the Arctic seaboard. They are now reduced to about 400, and like most other Innuits are rapidly diminishing in consequence of the extermination of the marine animals by the American whalers. Some villages have lost half of their inhabitants since the middle of the century, and in many places occur the ruins of former habitations, dating from remote times, when "men spoke like the dog." The tribes are still in the stone age, and those met by Ray at Barrow Point even refuse the gift of matches, preferring to strike fire by the primitive method of friction.

These Eskimo of Barrow Point are the most peaceful and gentlest of mankind.

They have no chiefs, either elected or hereditary, and dwell in a state of absolute equality. Neighbouring septs are never at war, and even crimes, if committed, go unpunished. The idea of personal property is scarcely developed, except in respect of boats; hence the people make no scruple to help themselves to whatever takes their fancy, unless it be in a cabin or a cache. On the other hand when in their turn deprived of anything, they make no demand for restitution. Wrangling is unknown, the children are left to amuse themselves in their own way, and the women are treated on a footing of perfect equality with the men.

Fig. 54.—INHABITANTS OF ALASKA.

Scale 1 : 20,000,000.



No contract is considered settled until ratified by them, and not even the shortest trip is undertaken without their advice. But the marriage tie is easily broken, especially on the occasion of long hunting or fishing expeditions, when the weaker women remain in the village with the old and feeble, while the others accompany the men. There are no funeral rites, although apparitions are much dreaded. They also fear Tunya, the invisible spirit, dwelling in the earth, the water, and the heavens; Kiolya, the spirit of the aurora borealis, is likewise dreaded, and when

obliged to be abroad during the starless nights they arm themselves with an ivory wand against the malevolent genii.

In certain districts the aged and children are killed during times of scarcity. As amongst the Siberian Chukches, the old people themselves ask to be despatched, whereupon they receive a dose of nux vomica; then their throats are cut and they are delivered to the dogs, who will be devoured in their turn. The Eskimo of Alaska seem to have lost some of their skill as carvers and sculptors. In the American museums are preserved admirable carvings on bone and wood, representing deer and other animals in all attitudes, carvings which no native artist could now execute. The Alaskans also cultivate pottery; but as boat-builders and fishers they are greatly excelled by their kindred of Greenland, and their arms are also of a very rude type compared with those of the eastern Innuits.

The Alaskan villages have always their *kashga*, or place of assembly, a large structure where are held public deliberations and theatrical performances. In the Kuskokvim district, these "municipal buildings" are furnished with benches disposed in amphitheatrical form. The ordinary dwellings consist of interlaced branches covered with a thick layer of hard earth and lighted by a block of ice placed in a narrow opening on top.

The Aleutians, so named by the Russians, call themselves Unungun, or Kaga-taya Kungios, that is, "People of the East," thus attesting their continental origin. All the early travellers describe them in much the same language that Ray applies to the Eskimo of Barrow Point. Thus Cook speaks of these islanders as the most peaceful and inoffensive people he had ever met, who might serve as examples for the most civilized nation on the globe. The Aleuts are in truth the most patient and resigned of mortals, never uttering a complaint or shedding a tear; yet they are animated by the deepest affection for their families, and have been known to die of hunger in order to leave their children the remaining stock of provisions.

As long as they enjoyed independence the Aleutians were a cheerful people; but after enduring the hard yoke of the Russians they became moody and depressed. No indignity had been spared them, and their manhood was so completely broken, that they henceforth submitted to everything with absolute resignation. Hence during the first period of the Russian rule, they rapidly diminished in number, and phthisis threatened to sweep away the whole race. According to Jelikov, the island of Kadiak alone had formerly 50,000 inhabitants; but in 1779 the whole population of the archipelago had been reduced to about 20,000. Fourteen years later they numbered little over 8,000 and in 1840 were reduced to 4,007. But since then they have again begun to increase, while the national type has been greatly modified by crossings. Although the "Creoles," as the half-castes are called, resemble their Aleut mothers more than their Russian fathers, the race on the whole seems to have been physically and morally improved. The Unalashka islanders had already been half Russified in character and usages fully fifty years ago.

Hence the usages of the Aleuts are known mainly by tradition and the discoveries made in the old habitations and graves. In the Shumagin Archipelago

Pinart has explored one of the burial caves, where the bodies were surrounded by various objects, such as carved and painted masks, some differing little from those of the ancient Toltecs, while others were applied to the face, doubtless in order to beguile the evil spirits, and avert their malice. The dead were stretched on mossy beds containing a complete collection of the implements and utensils at that time manufactured by the natives. In other graves the skeletons lie in a crouched attitude, the head resting on the knees, as in the case of the Peruvian mummies.

The Eskimo apply the term *Ingalit*, that is, "Unintelligible," to the Alaskan Indians, whose language they do not understand. These Indians, a branch of the widespread Athabascan or *Tinneh* family, occupy the Yukon basin above the low-lying alluvial tracts, and towards the south they reach the coast between Cook Inlet and the mouth of the Copper River. But in many places the transitions between the various races are so gradual that various tribes are grouped by some observers with the Eskimo, by others with the Red Skins. They are collectively called "*Siwaches*," this term being nothing more than an English mispronunciation of the Canadian "*Sauvages*," and they have themselves adopted the designation of "*Boston Siwaches*," thereby betraying a consciousness of their ethnical kinship with the United States Indians. On the Upper and Middle Yukon the Canadian trappers group them, under the name of *Loucheux*, with the neighbouring Indians within the British frontier. The special tribal names are for the most part derived not so much from any particular or characteristic features as from the localities occupied by them. Thus have been named the Yukon-Kuchins, or "People of the Yukon," the Tanana-Kuchins, or "People of the Knolls" (on the Tanana), the Kucha-Kuchins, or "Lowlanders," near the delta, the Hun-Kuchins, or "Foresters," the Atna-Tana, or "People of the Atna" (Copper River). These last, if not all the others, speak an Athabascan dialect, and Allen has detected a striking resemblance between them and the Mexican Apaches, who are also members of the Athabascan family.

Lying beyond the sphere of Russian and American influence, the Indians of the Tanana basin have preserved their primitive usages. They still paint their faces, wear head-dresses of feathers, insert bits of bone or stone in the cartilage of the nose, and adorn their skin robes with fringes and glass beads. The Tanana valley is probably the only part of North America where the Red Skin may still be seen in his primitive state. In one of the Upper Yukon tribes customs survive which recall the time when the widow sacrificed herself, as in India, on the funeral pyre of her husband. When the flames begin to dart up between the fagots, she is required to clasp the corpse, and allow her hair to be singed, and then thrust her hand through the blazing fire to touch his breast at the risk of her life. In return the ashes are placed in a pouch which she wears for two years round her neck.*

One of the most numerous and original of these tribes are the Kinai or Thuaiana, that is, "Men" who dwell in the Kinai Peninsula, east of the horn of Alaska. Amongst them the Shamans are by far the most respected members of the community. But they are expected on all occasions to recite songs, and to

* Sheldon Jackson, *Alaska*.

compose new verses in order to astonish and propitiate the genii. The most revered of superior beings is the constellation of the Plough, supposed to be the ancestor of the race. The raven is also venerated as their father, and this deity is the centre of all their national myths. Water, islands, rocks, everything in nature is peopled by spirits, who must be invoked to secure success in all their undertakings. Klush is the "great lord of the hill-tops," and he must be offered eagles' plumes, fish, seal-oil, in return for the anticipated game.

The populations scattered along the South Alaskan seaboard, south-east of the Copper River and in the adjacent archipelagoes, are known by the collective names of Thlinkit and Kolosh. The latter term, which has fallen into abeyance since Russian times, appears to be a corrupt form of the Aleutian *Kaluga*, meaning "disk," in reference to the lip ornament, analogous to the *botoque* of the Bolocudos, worn by the Thlinkit women.

Since 1840 the Thlinkits are said to have decreased from about 20,000 to 7,000 or 8,000, subdivided into numerous tribal groups, according to the islands or river valleys inhabited by them. Such are the Chilkats and Chilkuts of Lynn Sound, the Thahk-hiches about the headwaters of the Yukon, the Sitkas, from whom the capital of Alaska takes its name, the Stickeens, Tungas, and others. The Haidas of the Queen Charlotte Islands are also represented in South Alaska.

All these natives are distinguished by their prominent features, so different from the flat Eskimo face, and presenting a certain Jewish physiognomy. Although almost indifferent to cold, owing to their fish diet, they suffer much from the ravages of leprosy, by which some are disfigured beyond all human form. They are also infested by a particular species of parasite, the *staphylinus pediculus*. Their spacious and substantial habitations are embellished with intricate carvings, in which the initiated are able to read the family history. Formerly almost every house was also guarded by one or two wooden pillars 30 to 50 feet high, carved from base to top with figures of men, animals, and diverse objects, and at first supposed to be the creation of a grotesque fancy. Now they are known to be genealogical trees, in which each figure represents an ancestor of the race. The totems, or symbolical images distinguishing every family, are introduced, like the heraldic emblems of the European nobles, to commemorate the fame of their illustrious forefathers. In front of many houses stand two such trees, one for the paternal, the other for the maternal line. Certain villages on the seashore present forests of these sculptured posts sheltered by the natural pine forests of the background. The two great divisions are those of the Raven and the Wolf, subdivided into the secondary clans of the Frogs, Geese, Owls, Eagles, Bears, Sharks, Whales, and others of high and low caste. Some of the figures are executed with surprising truth to nature, attesting the marvellous powers of observation of the natives. But others, such as that of a crocodile on the grave of a chief, represent forms which the Thlinkits can never have seen, and have evidently reproduced from hearsay, or more probably from traditions handed down from times anterior to the migration to their present homes. All agree in the belief that their ancestors came originally from the south-east.

Under foreign influences the artistic sense is waning, and already the finest specimens found in their houses and graves have been removed to the American and European museums. The missionaries, also, in their excessive zeal, endeavour to suppress all the old mortuary rites—exposure of the body on a platform or in a canoe, burial in the house or neighbouring forest, submersion in the sea or streams, lastly, cremation, which is held up to special obloquy.

Fig. 55.—TOMB OF THLINKIT CHIEF.



Although generally of a mild temperament, the Thlinkits do not submit like the E-kimo to oppression. Intertribal wars are frequent, and in 1851 the Chilkats, crossing the Rocky Mountains, joined the Thahk-hiches in an expedition 500 miles from their homes, against Fort Selkirk, which was interfering with the local trade. Most of the tribes have chiefs; who, however, are bound to conform to custom—they cannot declare war without the assent of the council, and all abuse of power is promptly resented. On the other hand, the greatest honours are paid to them, and formerly human victims were even immolated on their graves.

The last captives reserved for these funeral rites were ransomed by the Russians towards the middle of the century.*

The whites are scarcely represented in Alaska, except by the "Creoles," nearly all half-breeds of Russian and Aleut descent without any strain of Indian blood. A few Norwegian fishers and American miners reside in the southern districts; but the recent attempt to attract Icelanders to Kadiak was unsuccessful, those islanders preferring the dryer though colder climate of Manitoba.

TOPOGRAPHY OF ALASKA.

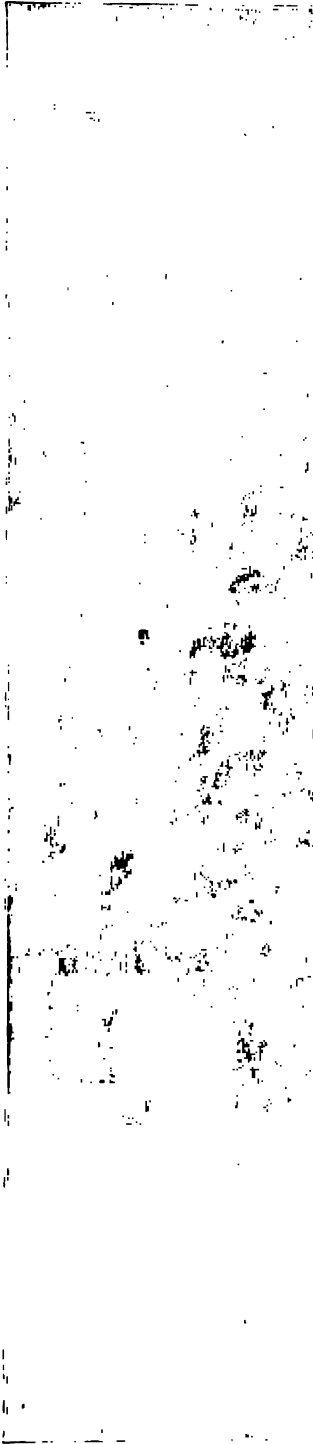
There are no American stations north of Bering Strait. *Barter Is'and*, west of the Mackenzie estuary, is, however, visited periodically during the fair, which is frequented even by the Asiatic Chukches. *Barrow Point* was occupied for two years only for meteorological purposes; but a station or harbour of refuge must soon be established for the whalers, either here or at *Port-Clarence*, an excellent haven sheltered by the extreme headland of the American continent. The village of *Kinging* (*Kingegan*), facing East Cape on the Asiatic side, is uninhabited except in summer, when it is frequented by the Eskimo from all quarters for trading purposes. During this season the island of St. Lawrence also does some traffic in furs, ivory, and whalebone with the Asiatic continent.

On the south side of Norton Sound are met the first white stations, *Unalaklit*, at the mouth of the river of like name, and *St. Michael*, an excellent harbour sheltered by a large volcanic island forming the natural port of the whole Yukon basin. Here is the chief station of the Fur Company; but the surrounding swampy district yields little produce to support an export trade.

Throughout its whole course of over 2,000 miles the Yukon has no larger centre of population than its little port of St. Michael. *Fort Selkirk*, at the confluence of the Lewis and Pelly, within the Canadian frontier, has remained a ruin since its capture by the Chilkats, and is now replaced by *Fort Reliance* and *Belleisle*, built by Mercier for the Hudson Bay Company. *Fort Yukon*, conveniently situated at the Porcupine confluence, was formerly a busy station during the barter season; but it had to be abandoned when the geographical surveys showed that it stood, not in British, but in American territory.

Some 20 miles below *Nuklukayet*, at the junction of the Yukon and Tanana, the new station of *Mercier* or *Tanana* was founded in 1868 by a French Canadian company. It is already one of the most important trading places in Alaska, and here are brought the best peltries by the Atna-Tanas and other Indians, sometimes from distances of over 300 miles. Farther on, the banks of the Yukon are almost completely deserted since the destruction of the Nulatos and other riverain tribes by wars and epidemics. *Anrik*, at the head of the portage across the tundras to St. Michael, marks the parting line between the Indians and Eskimo, neither of whom ever cross the common border. *Ikogmut*, on the southern bend of the Yukon, at the terminus of the Kuskokvim portage, is the centre of the Russian missions

* Hooper, *The Tents of the Tuskis*.



TANANA STATION, RIVER YUKON.



for the whole of Alaska. Lower down, near the bifurcation of the delta, stands the factory of *Andreierskiy*, one of the most important of the Company's trading-places.

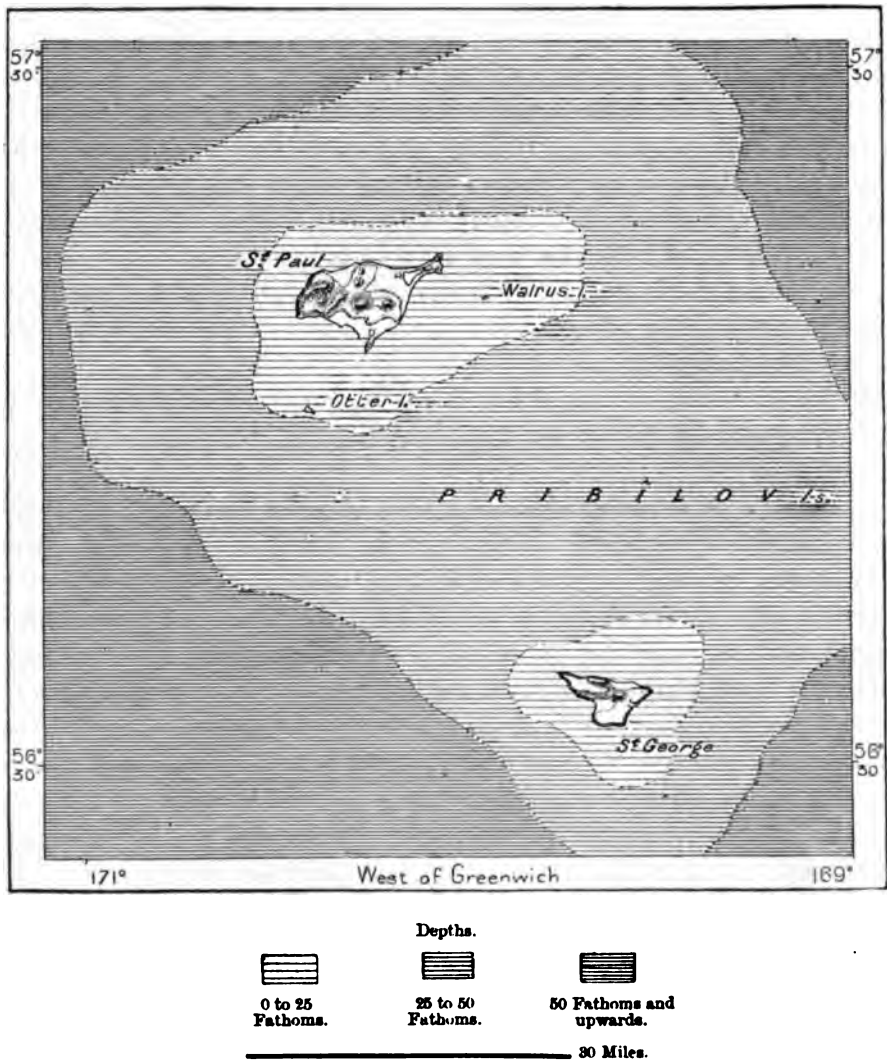
In this low-lying region there are several large camping-grounds, such as *Kashumuk*, *Kongiganagamut* and *Kinagamiut*, with a total population of about 3,000 full-blood Eskimo enjoying a relative degree of prosperity. The walrus still frequents the neighbouring coasts, and the natives display as much skill as their ancestors in carving the ivory obtained from the tusks of the animal.

On the Kuskokvim the chief station is *Kolmakovski*, founded in 1839 by the Russians 200 miles above the estuary. From *Port Alexander*, at the mouth of the Nushagak river or Bristol Bay, are exported the skins of the musk-rat, all of which are sold in France and Germany. But the whole trade of the Yukon basin, at most £5,000 a year, has greatly fallen off with the decrease of the native population, caused by the scarcity of game, drink, and general demoralisation. Nor are the American employés of the Company any longer satisfied with the modest pay which the English and Russian traders formerly gave to their trappers. Not more than fifteen whites are at present engaged in the peltry trade throughout the vast basin of the Yukon, where blankets are still the currency in all transactions with the Eskimo and Indians.

The Eskimo inhabiting the islands of the Bering Sea live almost exclusively on fish and game; but despite the abundance of animals in these waters they are at times prevented by the pack-ice from procuring sufficient supplies. Thus in 1878 as many as 400, including nearly all the children and over a third of the women, perished of hunger in the island of St. Lawrence, out of a total population of about a thousand. On the other hand the little Pribylov islands have become the chief source of wealth for the whole of Alaska, since the American Company has here established its famous fur-seal "rookeries." The archipelago, long known to the Aleuts under the name of *Atyk*, comprises, besides a few islets and reefs, the two islands of St. George and St. Paul, discovered by Pribylov in 1786 and 1787, the first 930 feet high, the second lower and dotted over with cones and craters. They were originally uninhabited, but were soon frequented by Russian and afterwards by English fishers, who pursued the fur-bearing seals so recklessly that these valuable animals were threatened with total extermination. The chase was thus necessarily interrupted, and would have ceased altogether had not some speculators conceived the idea of converting the island into a vast marine farm, and systematically working the fisheries with a close season. In a few years they were repopled, and at present contain on an average about 5,000,000 seals, of which 100,000 are yearly killed by the chartered company which has obtained the concession of the islands from the American Government at a yearly rental of £52,000. The same "Alaska Commercial Company" leases from the Russian Government the Siberian islands of Bering and Copper for a royalty of two roubles for every captured seal, or about £1,000 a year. The whole population of the Pribylov Archipelago, about 400 Aleuts and Creoles, depends directly or indirectly on the company,

being paid at the rate of forty cents (one shilling and eightpence) a skin, besides provisions and housing. But they are unable to dress the pelts, which are forwarded in the raw state almost exclusively to the London market. Rats have not yet appeared in the islands, which, however, swarm with mice; to exterminate this pest cats have been introduced, which in a few generations have been

Fig. 56.—THE SEAL ISLANDS.
Scale 1 : 1,200,000.



greatly modified in form, the tail becoming shorter and the voice much changed.*

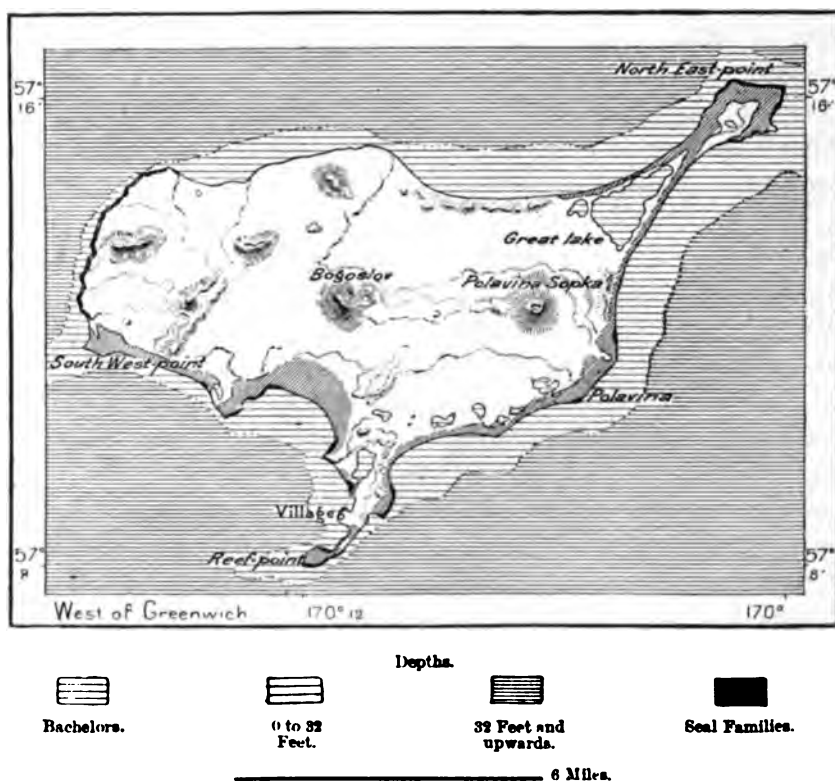
Besides the fur-seal, diverse other marine animals visit the archipelago, and

* See a graphic account of the Pribilof Islands and their seal-rookeries in H. W. Elliott's *Arctic Province*: London, 1886.

are pursued by the servants of the company. From 20,000 to 25,000 sea-lions (*eumetopias Stelleri*) inhabit the island of St. Paul during the summer, and 7,000 or 8,000 pass the season in St. George, where they numbered 200,000 or 300,000 at the close of last century. The Aleuts prefer their flesh to that of the fur-bearing seal, and utilise their skins to cover their baidaras or fishing-boats. The walrus is now met only in Walrus Island, a steep rock rarely visited by the whites stationed at St. Paul. The natives hunt the walrus for its tusks, and the sea-otter for its costly fur, which is usually valued at £12, but which has fetched as much as £100. The sea-otter has been almost completely exterminated in the

Fig. 57.—ISLAND OF ST. PAUL.

Scale 1 : 240,000.



Pribilof Archipelago, as well as in Cook's Inlet; but from 5,000 to 6,000 are still annually captured in the group of Saanak islets south of the horn of Alaska. Since the occupation of Alaska by the United States, this valuable animal has gradually increased in numbers by the enforcement of a close season.

In the Aleutian Archipelago the chief station is *Iluliuik* (*Illoolook*), better known by its Russian name of *Unalashka*, on the north side of Unalashka Island at *Captain's Harbour*, a well-sheltered haven, free of ice throughout the year. The neighbouring island of Unimak does some trade in sulphur, and before the introduction of firearms supplied the Aleuts with obsidian for the manufacture of

knives and harpoons. Nearly all the islands west of Unalashka are at present uninhabited, except Atkha, which has some permanently occupied hamlets, and Attu, at the extremity of the chain, whose inhabitants since the disappearance of the sea-otter have introduced the blue fox, and have also domesticated the wild goose.

Near the south-west extremity of Alaska Peninsula, some Norwegians, who have abandoned their mother tongue for English, have established themselves on a deep inlet near *Belkovsky*, whither they bring the produce of their fisheries and the sea-otters captured in the neighbouring Saanak islets. Recently, attention has been directed to the shoals of cod which abound on this seaboard as far as the Bering Sea on the one hand and the Juan de Fuca Strait on the other. The Alaskan cod, however, is far less appreciated than that of Newfoundland, probably because not so carefully cured for the European and American markets. The Scandinavian settlers at Belkovsky have also perhaps another source of future wealth in the carboniferous deposits of Unga in the Shumagin group, although the coal is very sulphurous.

On the mainland follow other stations at intervals of about 60 miles. But in these waters the most important is *St. Paul*, on the east side of Kadiak Island, which till 1832 was the capital of all the Russian American possessions. But the seat of the administration was, for no apparent reason, then removed to *Sitka* in Baranov Island, which certainly possesses less advantages than Kadiak. Here the rainfall is less copious, the forests are more accessible, leaving a few open spaces for cattle-breeding, the surrounding waters are richer in fish, and due north of Kadiak runs Cook's Inlet, where salmon attains its greatest perfection in size and flavour. The average weight is no less than 50 pounds, and some have been taken weighing as much as 100 pounds.

Nuchek or *Port-Eches*, on Nuchek Island, near the mouth of the Copper River; *Yukatat*, an abandoned penal settlement near the foot of Mount St. Elias; and *Lituya*, on the magnificent land-locked harbour below Cape Fairweather explored by Lapérouse, are mere fishing hamlets or stations visited chiefly by explorers. Towards the middle of the century as many as 400 whalers were occasionally assembled in these waters: in 1880 not more than forty visited all the Alaskan seas.

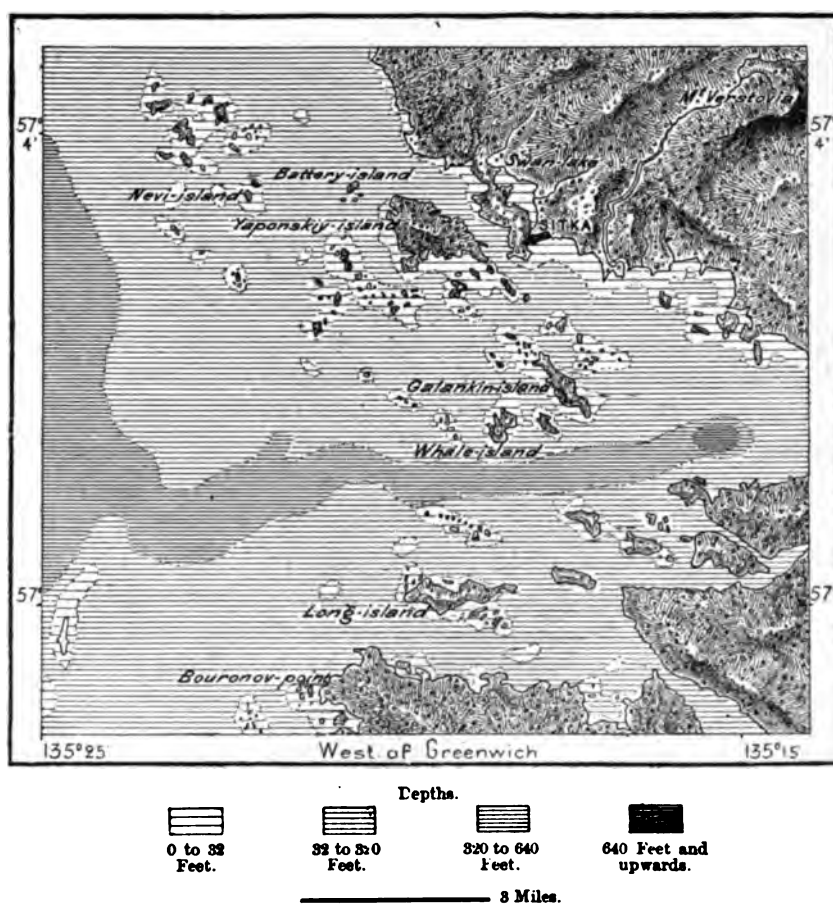
Juneau City, or *Harrishburg*, at present the largest place in Alaska, stands east of the St. Elias Alps and Cape Spence, at the foot of a steep forest-clad hill not far from the most productive gold mines in the whole territory. The richest deposits are in Douglas Island, separated by a narrow channel from Juneau, which also prepares considerable quantities of preserves and of salmon for the Californian market.

Sitka, the *Nova-Arkhangelsk* of the Russians, was founded in 1799, and became the capital of Alaska in 1832, when it was also declared a free port for the whole world. Nevertheless, it has remained a wretched village of some 300 inhabitants at the head of a sound on the east side of Baranov Island, which is still almost entirely covered with pine forests. Its gold, copper and coal mines

are abandoned, and its industries are reduced to fishing and some trade in timber. The town is not visible from the sea, being marked by headlands and numerous islets; but at the issue of a winding channel it is seen grouped on a rising ground near the bold headland of Cape Edgecumbe and at the western foot of the superb Mount Verstovia. Westwards the port is sheltered by Japonskiy Island, and, although obstructed by reefs and islets, is spacious enough to accom-

Fig. 58.—SITKA BAY.

Scale 1 : 200,000.



modate a whole fleet, but is scarcely visited except by the regular steamer from San Francisco.

Sitka is regarded as an unhealthy place, doubtless owing to the spongy nature of the soil. The streets are scavenged chiefly by a species of singing raven (*corvus cacatoll*), a bird which is sacred in the eyes of the natives, but which preys upon the poultry and even attacks swine. Some 20 miles south of Sitka flows a copious thermal and sulphurous spring, which has always been much frequented by the Thlinkits. On the slopes of Verstovia have been discovered some deposits of very pure bismuth.

Farther south the other so-called "towns," *Wrangell* and *Fort Tungas*, are inferior even to Sitka in population and traffic. They are merely factories, which till recently enjoyed some little importance as military outposts against the Indians. But Wrangell was really a large place during the four years between 1874 and 1879, when the Californian miners were flocking to the placers of Cassiar, in British Columbia. From Wrangell they received their supplies and through it forwarded their gold dust.

ADMINISTRATION—INSTRUCTION—TRADE.

Although an American possession by right of purchase, Alaska really lies almost beyond the United States from the administrative point of view. Military posts had to be established along the seaboard, the natives having resented the transfer of their territory to new masters. But there were no revolts, the report having been spread that these new masters "had many guns;" the garrisons were consequently withdrawn as useless. The central government has also incurred some expenditure in the exploration of the country; but the scientific missions have not been carried out on a strictly systematic plan. The sums voted for the instruction of the natives have not been directly applied, and even the custom-house, introduced at first in Sitka, has been everywhere abolished.

In fact Alaska had been considered unworthy to occupy the attention of the Washington Legislature, when the Government felt itself called upon to protect the interests of the Alaskan Company leasing the Pribylov Islands, by declaring the Bering Sea a "closed" basin, and interdicting seal and walrus fishing to all foreign vessels even beyond the line of 3 miles from the shore. But these pretensions seem incompatible with the precedents of international right, and will scarcely be accepted by Great Britain, the power most interested in the question of the fisheries in the northern seas. In 1821 Russia had also attempted to close the Bering Sea; but although at that time she held possession of both coasts, the claim was not admitted by the other naval powers.*

In religious matters the Russian Government has reserved a certain degree of authority, for it still remains the official protector of the Orthodox Greek religion and subsidises the churches of Sitka, Kadiak, and Unalashka. The Russian prelate residing at San Francisco is the spiritual head of all his co-religionists in Alaska. For the education of the natives in Russian, English, Eskimo, or Thlinkit the authority remains in the same way, not with the federal government, but with the Russian priests and the missionaries of various denominations. These religious bodies have in many places taken upon themselves to decree compulsory instruction for all native children between the ages of five and nineteen, and in Sitka they have even exercised judicial functions, condemning to a day's imprisonment pupils playing the truant. Nevertheless, general instruction cannot have yet penetrated very deeply, for the whole of Alaska is still without a single periodical of any kind.

* J. G. Kohl, *Geschichte der Entdeckung Amerika's*.



GENERAL VIEW OF SITKA.



Before 1884 there were neither justices nor police, and except in Sitka, Kadiak, Juneau, and Unalashka, justice was irregularly administered by the missionaries, white landowners or passing sea-captains. In the trading districts the real administrators are the representatives of the Alaska Commercial Company, owners not only of the seal-rookeries, but virtually also of the natives themselves, who, however, are far better treated than during the Russian sway.

The whole import trade of Alaska was valued in 1888 at £64,000. Sitka and the other southern seaports are now connected by a fortnightly steam service with San Francisco, and in summer the magnificent scenery attracts numerous American and other tourists. The project has even already been mooted of a railway to run from the Canadian Trunk Line along the east foot of the Rocky Mountains to the Upper Yukon basin. The fertile tracts along the Peace River as well as the mineral districts of the Stickeen Valley would thus be opened up for colonisation, and a few immigrants would then undoubtedly find their way to the more attractive parts of Alaska. Sitka is connected by a telegraph with the North American system; but the line intended to cross Bering Strait and connect the Old and New Worlds was abandoned in 1867, when this project was rendered useless by the success of the Transatlantic Cable.





CHAPTER V.

THE DOMINION OF CANADA AND NEWFOUNDLAND.

I.—GENERAL CONSIDERATIONS.

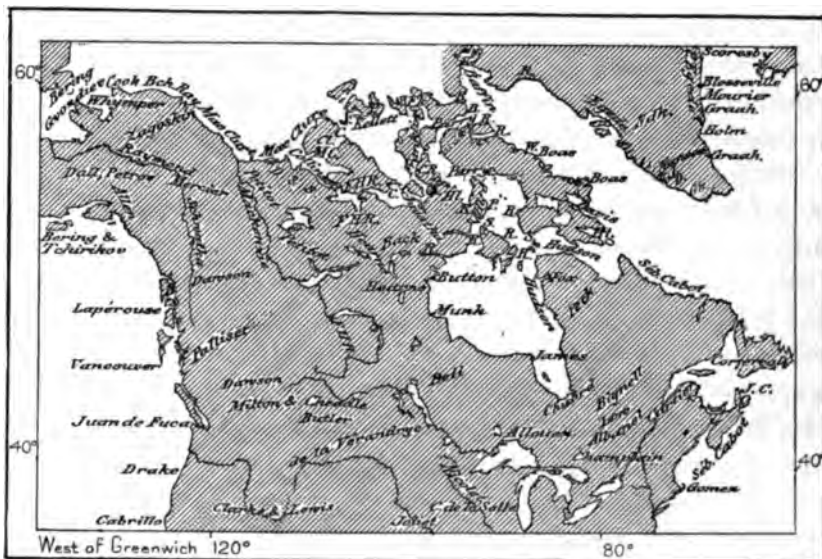


THE vast stretch of lands occupying all the northern section of North America, and politically defined as the "Dominion of Canada," constitutes no distinct geographical unit. The frontier towards the United States is in a great measure purely conventional, running for about 1,300 miles from Juan de Fuca Strait to the Lake of the Woods along 49° north latitude, an ideal limit which crosses lofty ranges, plateaux, and rivers, irrespective of all mountain axes or divides between the fluvial basins. Thus the headwaters of the Columbia river lie within Canadian territory, while its lower course flows through the north-west corner of the United States. So also the Upper Missouri affluents rise north of the political frontier, and on the other hand the Red River of the north, main branch of a stream falling into Hudson Bay, takes its origin far to the south of the border near the sources of the Mississippi. Beyond the Lake of the Woods, which is traversed by a tortuous dividing line regardless of all natural conditions, the frontier follows the Rainy Lake and River, and an old portage to Lake Superior. In the region of the great lakes, however, the line coincides with the natural features, skirting the north side of Lake Superior to the Sault Ste. Marie, then dipping south of Cockburn and Great Manitoulin Islands, so as to enclose the whole of the peninsula formed by Lakes Huron, Erie, and Ontario, and, lastly, following the left bank of the St. Lawrence as far as 45° north latitude. But here again begins another conventional line, keeping to the same parallel across rivers and lakes to the vicinity of the source of the Connecticut river. Beyond this point the common frontier runs at first north-east along a mountain crest, and is then further deflected in such a way that the State of Maine approaches at one point close to the right bank of the St. Lawrence and then encroaches on the greater part of the Upper St. John valley.

The territory of the Dominion is geographically known in direct proportion to the density of its civilised populations. Canada, properly so called, that is, the part of the St. Lawrence valley comprised between the great lakes and fluvial

estuary, is at once the most thickly peopled and the most thoroughly surveyed. Farther west, the points astronomically determined become rarer, but are continually increasing and drawing nearer to each other, thanks to the opening of the transcontinental railway and the rapid settlement of the country. Geological sections and charts are being multiplied; the main directions of mountain ranges and rivers, hitherto roughly sketched, are being more accurately determined. In the southern regions, near the United States frontier, the early itineraries have

Fig. 59.—CHIEF EXPLORERS OF NORTH AMERICA.



1494. J. C. John Cabot.
1494-98. Sebastian Cabot.
1500. Cortereal.
1524. Gomez.
1535. Cartier.
1542. Cabrillo.
1576. Frobiisher.
1579. Drake.
1586. Davis.
1592 (?) Juan de Fuca.
1610. Hudson.
1612. Button.
1618-15. Champlain.
1618. Baffin.
1619. Munk.
1631. James.
.. Fox.
1634. Albanel.
1659-62. Chouard.

1669. Allouez.
1671. Marquette.
1673. Joliet.
1682. Cavalier de la Salle.
1721. De la Vérandrye.
.. Egede.
1737. Bering.
1750. Gvozdev.
1741. Bering and Tchirikov.
1770-72. Hearne.
1774. Cook.
1786. Lapérouse.
1786-87. P. Egede.
1789-93. Mackenzie.
1792. Quadra, Vancouver.
1806. Clarke and Lewis.
1818. R. Ross.
.. P. Parry.
1818-22. Scoresby.

1819. F. H. R. Franklin,
Hood, and Richardson.
1819-15. Franklin.
1821-30. Graah.
1826. Bch. Beechey.
1831. Blomme ille.
.. J. C. Ross.
1833-35. Back.
1836-43. Nicolet.
18 7-39. Deane and Simpson.
1842. Zagoskin.
1851. MacClure.
.. Collinson.
.. Kellett.
1854-60. Kane.
1858. Palliser.
1859. MacClintock.
1859-69. Hall.
1863. Milon and Cheadle.

1862-73. Petitot.
1866. Whympet.
.. Dall.
1869. Raymond.
1869-73. Butler.
1870, 83. Nordenskiöld.
1873-86. Mercier.
1874-87. Dawson.
1879. Mourier.
1879 83. Schwatka.
1880-83. Petroff.
1881-82. Ray.
1883-84. Boas.
1884. Holm.
.. Low.
.. Peck.
1885. Bignell.
.. Allen.
1888. Nansen.

ceased to possess anything beyond an historical interest, having already been replaced by more regular surveys. But towards the north our knowledge of the general configuration of the land is still dependent on the broadly-traced routes of such explorers as Hearne, Muckenzie, Back, Richardson, Petitot, or Dawson.

In the northern continent, all the natural divisions mainly follow the direction of the meridian. Thus the Pacific seaboard, the coast ranges, the plateaux and

crests of the Rocky Mountains system, the terraced tablelands, median plain, more or less parallel ridges of the Laurentian and Appalachian chains, and lastly, the Atlantic coastlands are all disposed from north to south, or at least run in the direction from the polar to the torrid zone, whereas the frontiers of the two great continental states have been drawn transversely to all these natural limits. Even in the climates there is no approximate coincidence between the Canadian frontier and any isothermal line, the meteorological phenomena being distributed not so much according to latitude as along greatly deflected curves, which in many places run parallel with the continental coastlines. The zoological and botanical limits are also far from coinciding with the degrees of latitude.

Were the Canadian populations grouped in a compact homogeneous mass, the Dominion might be freely developed in a distinct political nationality without enduring the inconvenience of the fantastic frontier traced along its southern border. But this vast region, exceeding the United States themselves in superficial area, is still sparsely peopled, the inhabitants being for the most part distributed along the frontier, and in some places alone, particularly the peninsular part of the province of Ontario, and the region of Lower Canada of which Montreal is the centre, this cordon broadens into loops, where the population is dense enough to constitute really independent groups and autonomous centres of political and social life. But elsewhere along the chain of towns and settlements, the common national sentiment is weakened by the natural attractions of the conterminous communities irrespective of fictitious diplomatic limitations.

No great importance can consequently be attached to a precarious political frontier liable to be effaced by the least change of equilibrium. It will therefore be more convenient to neglect the geometrical lines traced on the maps by the diplomatists of London and Washington, and deal separately with the natural regions as determined by mountain ranges, river valleys, and climates. On the other hand, the island of Newfoundland, as well as a portion of Labrador, may be regarded as fragments of the Canadian territory, although not yet forming part of the Dominion as officially constituted.

II.—BRITISH COLUMBIA.

ROCKY MOUNTAINS—QUEEN CHARLOTTE AND VANCOUVER ISLANDS.

The limits of British Columbia, as fixed by legislation, are no less eccentric than those of the Dominion itself. In order to simplify the administrative requirements, it was thought sufficient to trace the divisions according to the rough charts at the time available, without any adequate knowledge of the physical conditions. Thus the northern frontier was drawn at 60° north latitude and the southern at 49°. Towards the east, one half of the parting-line between British Columbia and the North-West Provinces was made to coincide with 120° west longitude, while on the north-west it follows the already described serpentine

Alaskan boundary. The only natural frontiers are, on the south-west, the Pacific coast, and on the south-east, the crest of the easternmost ridge of the Rocky Mountains. Had the limit been taken as indicated by the routes of the Canadian trappers, the discoveries and formal acts of possession made by Vancouver, and the first surveys of the Columbia estuary by Grey in 1792, the basin of this great river, as well as Puget Sound and the Juan de Fuca Strait, would have been assigned to Canada. But the English diplomatists displayed less energy than their American opponents, and the parting-line, as fixed by the arbitration of the German Emperor in 1872, left to the States all the islands and inlets lying south and east of the deepest channel between the mainland and Vancouver Island. The San Juan Archipelago, between the Haro and Rosario Straits, was also ceded to the Americans.

Overlooking these arbitrary lines of demarcation, British Columbia may be regarded as a distinct geographical unit by studying separately the whole section of the Rocky Mountains which stretches from the sources of the Yukon to the middle course of the Columbia, and which is indented by innumerable fjords of the seaboard between the Alaskan Islands and the Juan de Fuca Strait. This region has an approximate area of 370,000 square miles, with a scattered population of scarcely 150,000 Indians and whites; the latter element, however, rapidly increasing, at least in the southern and more settled districts. The seaboard was exclusively explored by Spanish and English navigators, especially Quadra and Vancouver, as shown by the geographical nomenclature, although the large island is no longer "Quadra and Vancouver," as had been agreed between the two mariners.

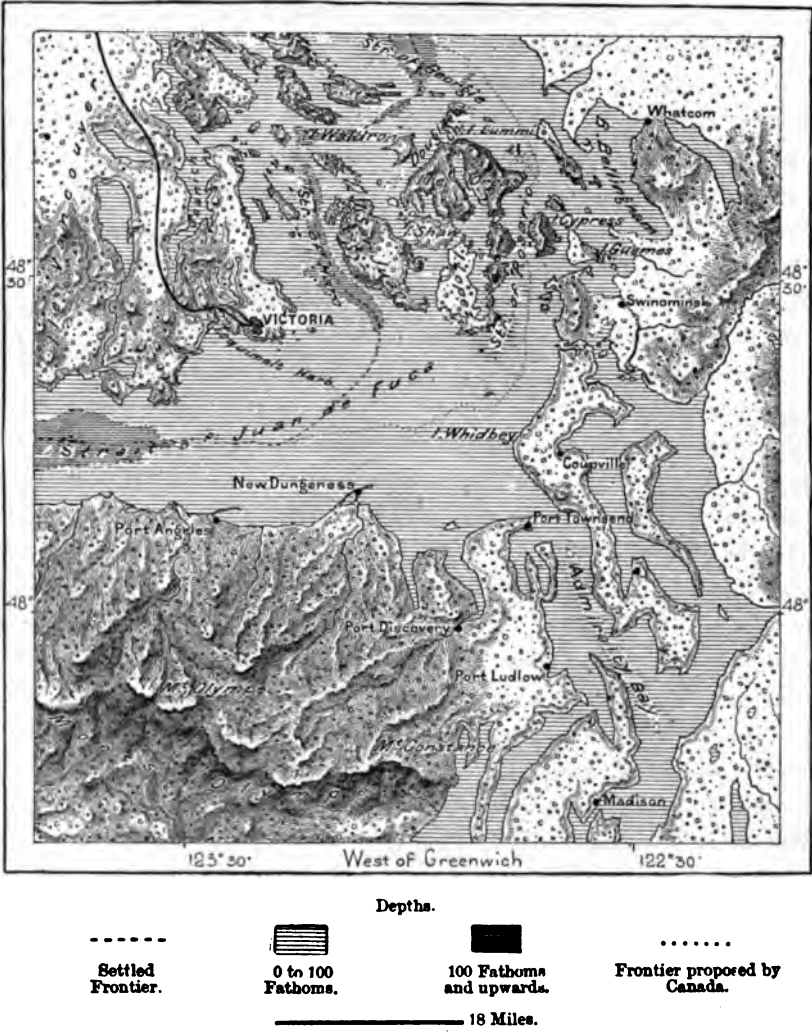
The interior has been gradually explored by the trappers and miners; but Mackenzie was the first scientific traveller who crossed the mountain ranges between the north-west plains and the Pacific in 1792. Mackenzie followed the middle course of the Fraser river, which he supposed to be the Columbia, and which in 1806 was named after the Scotch trader, Simon Fraser. The travellers, mostly servants of the Hudson Bay Company, who opened up this section of the Pacific Seaboard were nearly all Scotchmen, and the whole region was long known by the name of New Caledonia.

PHYSICAL FEATURES OF BRITISH COLUMBIA.

The various chains of the Rocky Mountains comprised between Alaska, the Mackenzie basin, and the head-waters of the Peace River, under 56° north latitude, are known only in a general way through the reports of the traders and miners. But their geological survey has still to be made, and in this respect they remain a blank on our maps. The main range, running parallel with the Alaskan coast, east of the Lewes, or Upper Yukon basin, appears to be of moderate elevation, and forms only a secondary water-parting, being pierced by streams belonging some to the Arctic, some to the Pacific basin. Thus the upper affluents, both of the Stickeen and of the Skeena, rise in the same regions as the tributaries of the

Liards and Peace rivers, which flow to the Mackenzie. In these regions the loftiest ranges do not probably exceed 10,000 feet; towards 55° 30' north latitude they develop a central nucleus, in which are united the various parallel chains

Fig. 60.—BOUNDARY LINE BETWEEN CANADA AND THE UNITED STATES IN THE SAN JUAN ARCHIPELAGO.
Scale 1 : 1,250,000.



coming from the north, and whence diverge the upper waters of the Stickeen, Skeena, Peace, and Fraser rivers.

Immediately south of this nucleus, the "Peak Mountains" of the older maps, the whole orographic system falls so rapidly that the whole of British Columbia, from the Pacific Coast to the plains watered by the Peace River, may be traversed without anywhere ascending more than 3,400 feet; * the breach formed by the Peace itself is only 2,000 feet high. The great northern bend of the Fraser in-

* G. M. Dawson, *Quarterly Journal of the Geo. Soc.*, Feb., 1878.

dicates pretty accurately the centre of this depression, which is characterised by the presence of grey or whitish arenaceous clays regularly stratified to a considerable depth, in some places as much as 100 and even 200 feet. They rest everywhere on layers of boulder clay, more or less modified and strewn with gravel and erratic blocks. These deposits, which extend to a great distance between the ranges, are evidently due to the action of a vast inland sea, which is still represented by the present lakes and plains of Chilcotin, and which perhaps communicated with the ocean through a strait traversing the whole system of the Rocky Mountains.

The main chain properly so called, running due north-west and south-east, begins south of the Peace River in hills scarcely 3,000 feet high, but rapidly rising above the plains watered by the Athabasca and its tributaries. The Yellow Head Pass, through which it was at first proposed to carry the transcontinental railway, is 3,820 feet high, and farther south the Athabasca Pass is dominated by Mounts Brown and Hooker, said to be respectively 16,000 and 17,000 feet. But the surveyors who have begun the triangulation of the region near the frontier consider these rough estimates excessive. In any case, the passes connecting both slopes in this part of the main range are so easy as to excite the astonishment of travellers. Milton and Cheadle had actually crossed the Yellow Head Pass before discovering that they had traversed the water-parting between the two basins.

South-east of the Athabaskan group follows a series of peaks generally named after British naturalists; such are Lyell, Sullivan (7,850), Forbes (8,440), Murchison, Balfour, Lefroy (11,600). These are the mountains perceived by the traveller advancing from the plains of the Saskatchewan, and more specially known as the "Rockies." Seen from the rolling prairies of Alberta territory their greyish, bare walls, nearly pyramidal in form, and streaked with snow on their northern slopes, present an imposing appearance. Some of the escarpments reveal their horizontal strata, deposited during the Devonian, Carboniferous, and Cretaceous ages; others have been diversely folded and dislocated, but are inclined for the most part towards the east. Some resemble enormous slabs of slate, some pyramids cut into regular steps.* East of the main range, the foot hills, running in the same direction, traverse the centre of the plain in disconnected groups, such as Dalhousie, with its vertical castellated walls over against the Yellow Head Pass, the more uniform Palliser Range named after one of the first explorers, and the Porcupine Hills south of Calgary, near the frontier, which also belong to this system of the "Little Rockies."

The part of the chain crossed by the Pacific Railway, several portions of which have been reserved as "national Parks," is naturally the best known section of these uplands. From the foot of the hills, already 3,000 to 4,000 feet high, the road slopes very gradually and uniformly to a narrow gorge, the Gate of the Rocky Mountains, beyond which it ascends to its highest point, at Kicking Horse or Hector's Pass (5,300 feet), dominated on the north by Mount Stephen. The Kananaskis (Palliser) and most other southern passes are still lower, scarcely exceeding 5,000 feet; but the Kootenay, about 30 miles from the frontier, rises

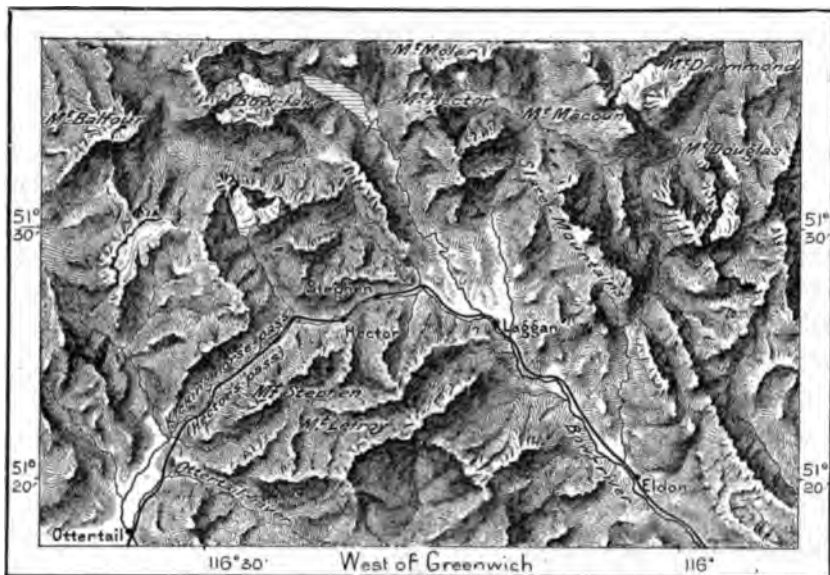
* W. Spotswood Green, *Proc. of the R. Geog. Soc.*, March, 1889.

to an elevation of 5,950 feet. In its upper course, the Kananaskis, already a broad stream, plunges over a romantic fall, after which it continues its course, with little interruption, down to its confluence with the Saskatchewan.

Farther west the parallel ridges occupying the space enclosed by the winding valleys of the Columbia and its great affluent, the Kootenay, are distinguished from the main chain of the Rocky Mountains by the name of the Selkirk Range. They are crossed by the Pacific Railway at Roger's Pass (4,275 feet), which is dominated by mountains about 10,000 feet high. Although generally lower than those of the

Fig. 61.—KICKING HORSE PASS.

Scale 1 : 550,000.

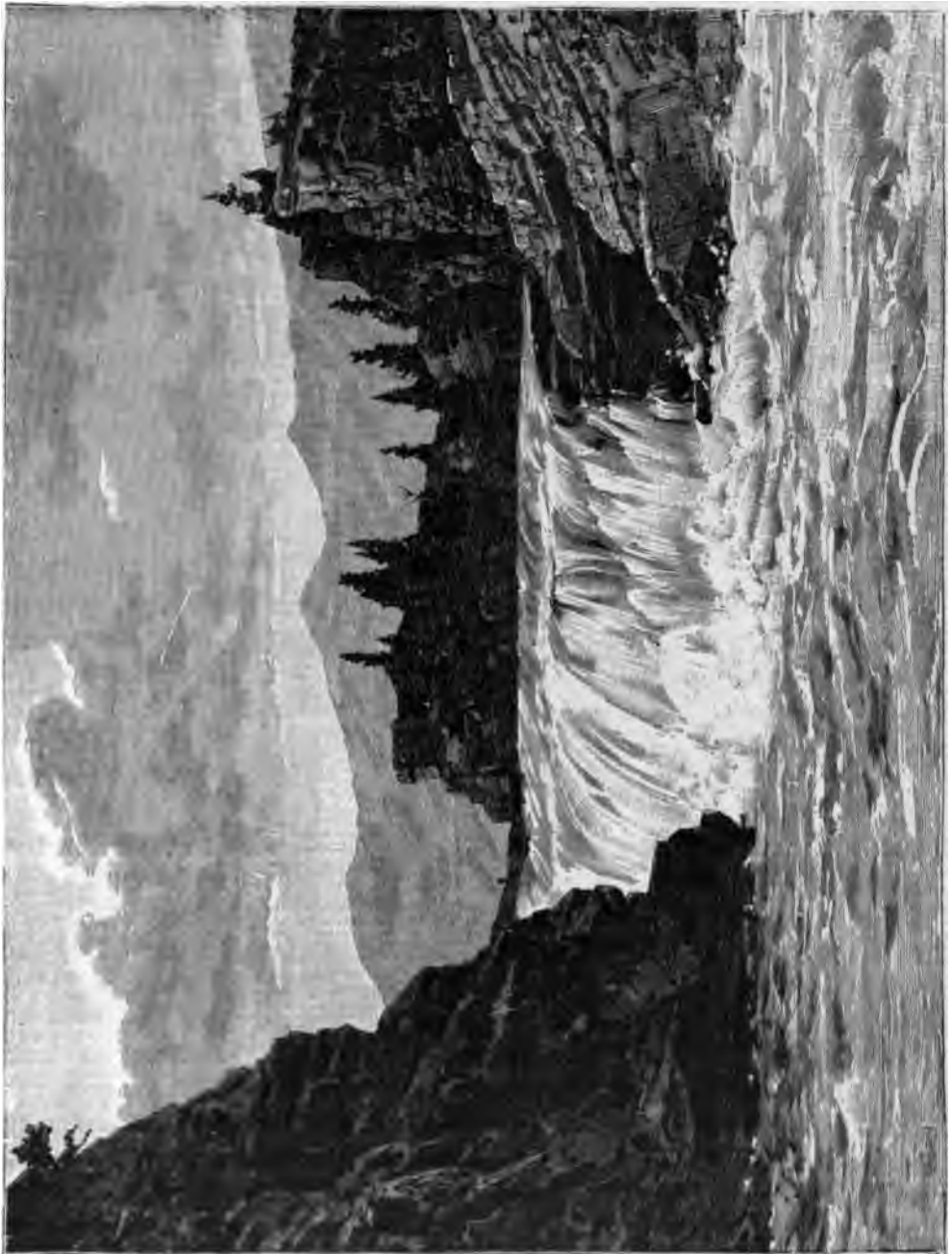


Rockies, the Selkirk peaks have larger glaciers, a fact due to the greater abundance of moisture brought by the rain-bearing clouds from the Pacific. A snowfield just south of the culminating point, Mount Sir Donald (10,645 feet), has a superficial area of over 20 square miles, and sends down several ice streams into all the surrounding valleys. Owing to the same cause, the slopes below the snowline are clothed with a magnificent forest vegetation, which, however, greatly impedes the progress of exploration in these uplands. Of all the highlands in the New World, the Selkirk Range most resembles the European Alps, everywhere presenting the same contrast between verdant promontories and valleys filled with glaciers. Enormous moraines, now abandoned in the lower valleys, show that in this region the glacial rivers were far more extensive than at present.

Another chain, less regular than the parallel Selkirk and Rocky ranges, rises west of the Columbia valley below the great northern bend. This is the Gold Range, so named from the auriferous sands which till lately were profitably washed

in its lower valleys. Its culminating points are lower than those of the Selkirk highlands, but it appears to be of older formation, the prevailing rocks being granites, gneiss, crystalline schists, and other azoic deposits.

Fig. 62.—KANANASKIS FALLS.



In general, the relief of British Columbia presents the form of an inclined plane which, from the watershed of the Rocky Mountains, falls gradually south-westwards in the direction of the Fraser estuary in the Gulf of Georgia. Were

the marine level raised 3,000 feet a great part of the region dominated by the ramifications of the Gold Range would be changed to straits and inlets. Towards the conventional frontier at 49° north latitude, the various chains lose their distinctive geological characters, here consisting of uniform strata deposited during the first fossiliferous ages, but still separated by deep valleys. Thus a certain natural limit, vaguely coinciding with the political boundary, may be traced north of the lower Columbia between the conterminous states.

On the seaboard the so-called "Coast" or "Cascade" Range, continuing the Alaskan mountains southwards to California, really consists not of one, but of a multitude of distinct masses and ridges; all, however, disposed north-west and south-east, parallel with the coast and the main axis of the Rocky Mountains. Their rugged slopes and the savage aspect of the steep cliffs and escarpments, over which were formerly discharged vast streams of basalt, impart to these uplands a great apparent altitude, although they are really somewhat lower than the eastern chains. Some fall below 2,000 feet, while the highest peaks, towards the south, approach 10,000 feet. The whole system is decomposed into distinct fragments, towards the coast by variously ramifying fjords, and towards the Fraser River by lakes or old lacustrine valleys, which at a remote geological epoch were themselves fjords.

FJORDS AND GLACIERS.

The present marine inlets resemble those of Scotland and Norway, only they are generally narrower, and bounded by higher and more parallel cliffs. Their form has suggested the hypothesis that they are river valleys slowly eroded by the water, according as the seaboard rose above the marine level. But these rivers were succeeded by ice-streams, which gradually filled the fluvial bed, thus preserving its exact outline throughout the whole glacial period. When released from their icy fetters, the Columbian fjords were subjected to further transformations. Their upper reaches were filled by the alluvial matter of their lateral affluents, the parts that have thus silted up being indicated by marshy tracts. Small submarine deltas continue these tracts for a short distance into the fjord, which then abruptly sinks to enormous depths, ranging in some places from 1,000 to 1,200 feet. Lastly, a now flooded moraine, as on the coasts of Greenland and Scotland, marks the parting-line between the open sea and the inner sounds.

The whole of the Columbian seaboard is thus indented by profound inlets, such as the Portland Canal on the Alaskan frontier, which penetrates over 40 miles inland opposite Dixon Channel, between the Prince of Wales and Queen Charlotte Archipelagoes. Here the broad channel obviously forms a seaward continuation of the Canal, both being due to the same geological agents. Opposite the Queen Charlotte Islands occurs the still more intricate Douglas Channel, which is again continued south-westwards by the Gardner Channel, penetrating nearly 70 miles inland. Farther south the Dean and Bentinck inlets are remarkable for their extreme regularity, forming two long canals at right angles with the coast, connected by a transverse canal, and throwing off several secondary canals also at

right angles. Dean Inlet, with the lakelets and valleys forming its eastward continuation, is connected with the Fraser river by a continuous depression, the whole system showing clearly that fjords, lakes, and rivers were all determined by the same geological agencies.

In the southern part of Columbia numerous analogous formations, such as

Fig. 63.—JERVIS INLET.

Scale 1 : 800,000.

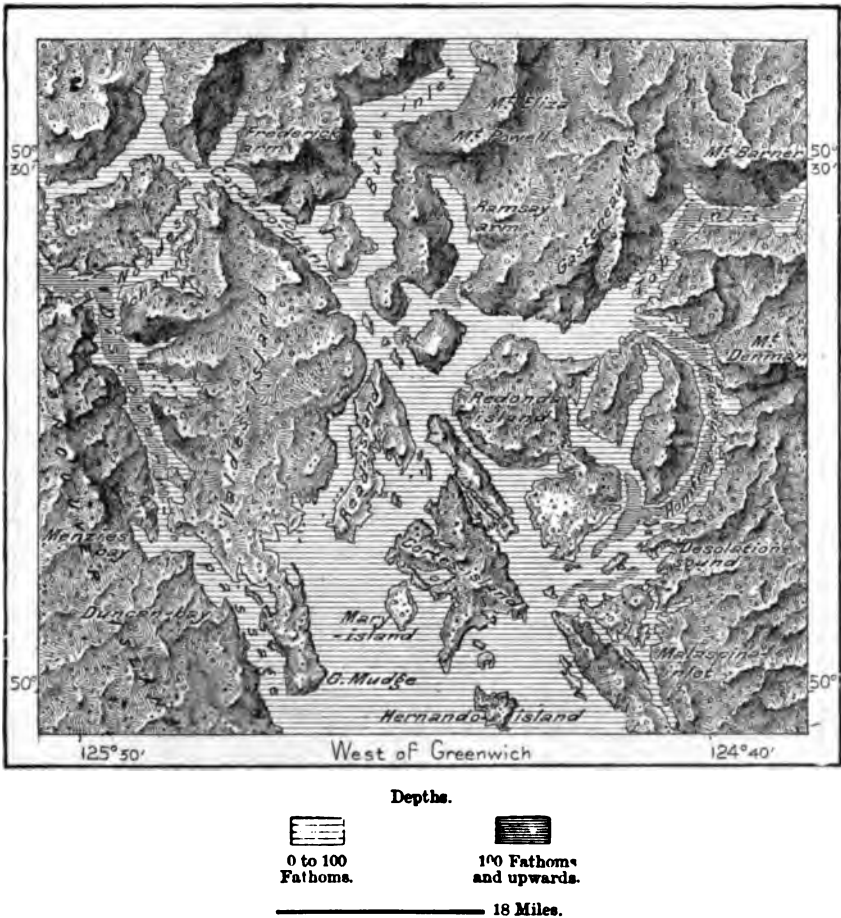


Knight, Bute, Toba, Jervis, Howe, and Burrard Inlets, are connected through a labyrinth of channels with the broad Gulf of Georgia flowing between Vancouver Island and the mainland. And the Gulf of Georgia itself, from its entrance at Juan de Fuca Strait and through the corkscrew windings of Puget Sound pene-

trating southwards into the heart of Oregon, is nothing more than a vast fjord projecting its arms in all directions like an enormous octopus.

These southern fjords, owing to the neighbourhood of more settled districts and easier highways of communication, are better known than those of the north. Many of them had to be explored in detail when the engineers were searching for the most convenient oceanic terminus of the trans-continental railway. None of them present such an imposing aspect as Jervis Inlet, which exceeds 50 miles in length, with a mean breadth of 3 miles, its rocky walls at some points con-

Fig. 64.—DISCOVERY PASSAGE.
Scale 1 : 1,100,000.



verging still closer, and rising in a series of terraces to heights of 4,000 or 5,000 feet. In the immediate vicinity of the coast a 200-fathom sounding-line does not everywhere touch the bottom, and here and there the submarine slopes plunge into chasms 280 fathoms deep. In summer hundreds of cascades, tumbling from the edge of the cliffs, fill the gloomy gorge with an incessant din, and ruffle the surface with innumerable intersecting ripples ; in winter and spring the noisy waters are

replaced by crashing avalanches, whose thunders are re-echoed from side to side of the rocky crags. Few Indians venture to navigate the fjord, whose shores are still uninhabited by the white man. Even the vegetation is scanty, and the hardy pine scarcely shows itself on the ledges of rock exposed to the gales from the high seas.

Not only did the ice-streams at one time fill the now flooded fjords, but they also overflowed their banks, and in many places the islands on the coast were connected by crystalline bridges with the mainland. At that time the Columbian seaboard presented the same spectacle as that of Greenland, where so many marine straits are obliterated by ramifying glaciers. All the insular groups at the entrance of Douglas and Dean Inlets thus formed part of the continent, and the great Island of Vancouver itself acquired a peninsular aspect. At the narrowest part of the intervening waters, that is, at Johnstone Strait, Discovery Passage, and Seymour Narrows, the channel is considerably less than two miles wide, while the geological strata, granites or triassic rocks, correspond exactly on either side; the stratified sands and gravels containing erratic boulders were evidently deposited on both sides by the same glacial stream.* In these narrows the opposing tidal waves produce formidable whirlpools, all the more dangerous because of the reefs rising in mid-channel. At times the tides rush through with a velocity of 10 or 12 miles an hour, irresistibly sweeping along all sailing vessels, and sometimes even steamers.

VANCOUVER AND QUEEN CHARLOTTE ISLANDS.

The general aspect of Vancouver Island and neighbouring coastlines, with their hummocky rocks, boulders, clays, and gravels, has led to the conclusion that all the southern part of the island was formerly covered by an ice-cap at least 650 feet thick, and that this glacier, descending from the continental snowfields, advanced for about 60 miles seawards.† Since that epoch erosions have again sculptured the islands, many of which are composed of conglomerates overlying sandstone, and rising in vertical cliffs above caverns, through which rush the roaring waters.

Although at present separated by a marine channel about 130 miles wide, the Queen Charlotte and Vancouver Islands belong to the same geological formation, constituting a single chain, which runs parallel with the Rocky, Selkirk, Gold and Cascade ranges. Of the Queen Charlotte group much of the relief has disappeared. An intermediate valley has been transformed to a strait, the Skidegate Inlet and the Archipelago is thus divided into the two large islands of Graham in the north, and Moresby in the south; the latter continued southwards by a chain of reefs and islets, and rising in some of its peaks to a height of 5,000 feet. The more compact island of Vancouver presents a more regular chain of mountains, which culminate about the geometrical centre of the island in the Victoria peak (7,670 feet). The disposition of the granites, triassic and cretaceous rocks, in both groups is such as to leave little doubt of their geological continuity. Like the

* Alfred R. C. Selwyn, *Geological and Natural History Survey of Canada*.

† G. M. Dawson, *op. cit.*

continental seaboard, the west coast of Vancouver is indented by fjords, one of which, the Quatsino Sound, ramifies through the interior nearly to the opposite coast. Farther south is the smaller but better known Nootka Sound, visited by so many great navigators since Cook's voyage in 1778.

COLUMBIAN LAKES AND RIVERS.

In the interior of Columbia, the lakes, although partly filled up by *débris* and fluvial deposits, are almost as numerous as the fjords of the seaboard. They abound especially in the region formerly occupied by the vast freshwater sea between the Skeena, Fraser and Peace valleys. Here still survive the Tacla, Trembleur, Stewart and François reservoirs, all of which send their overflow to the Fraser through the Nakosla or Stewart River. Lakes Chilco, Quesnelle, and Shuswap, belong also to the Fraser basin; while the southern lakes—Kootenay, Arrow, and Okanagan—drain to the Columbia or its affluents. All these still flooded or dried up basins occupy fissures in the terrestrial crust uniformly disposed either north-west and south-east, parallel with the axis of the Rocky Mountains, or else north and south, or west and east. By their intersection, the three systems of fractures develop a network of lines, which are frequently disposed in symmetrical triangles, a phenomenon analogous to that observed in the South of Norway.

The Columbian rivers, which were formerly, and to some extent still are, chains of lakes, also flow in many parts of their course through fissures in the terrestrial crust, little modified by erosion and sedimentary deposits. The Taku, which falls into the Alaskan fjord of like name, is joined by headstreams flowing through narrow fractures running parallel with the coast. So also the Stickeen, a very copious river, which rises in the lacustrine region of Columbia, and which in its lower reaches is also comprised within Alaskan territory. Several of its upper tributaries, as well as the main stream itself, present a zigzag course, turning abruptly at right angles in the clefts of their rocky beds. A little above its mouth the Stickeen is interrupted by falls, below which its banks are skirted right and left by glaciers, thrusting their frontal walls and moraines right into the current. Farther south the Nasse, near which rises an extinct volcano, flows entirely within Columbian territory. It has given a definite form to its valley, whereas the far more copious Skeena still retains throughout a great part of its course the aspect of a chain of lakes. Lake Babine, one of these narrow basins, is no less than ninety miles long. It was so named by the Canadian trappers from the "babine," or lip-ornament, worn by the Indians dwelling on its banks, and resembling the "kolosh" of the Thlinkits and Haidas. All the lower course of the Skeena is still a narrow fjord dominated by mountains over 6,000 feet high.

Excluding the Columbia, whose upper course alone lies within Canadian territory, the Fraser is the largest river in British Columbia. It rises in the Yellow Head Lake, whence it flows first north-west, parallel with the axis of the Rocky Mountains; then it bends at a sharp angle round to south, in order to follow a fissure which is disposed in the direction from north to south. At this angle it

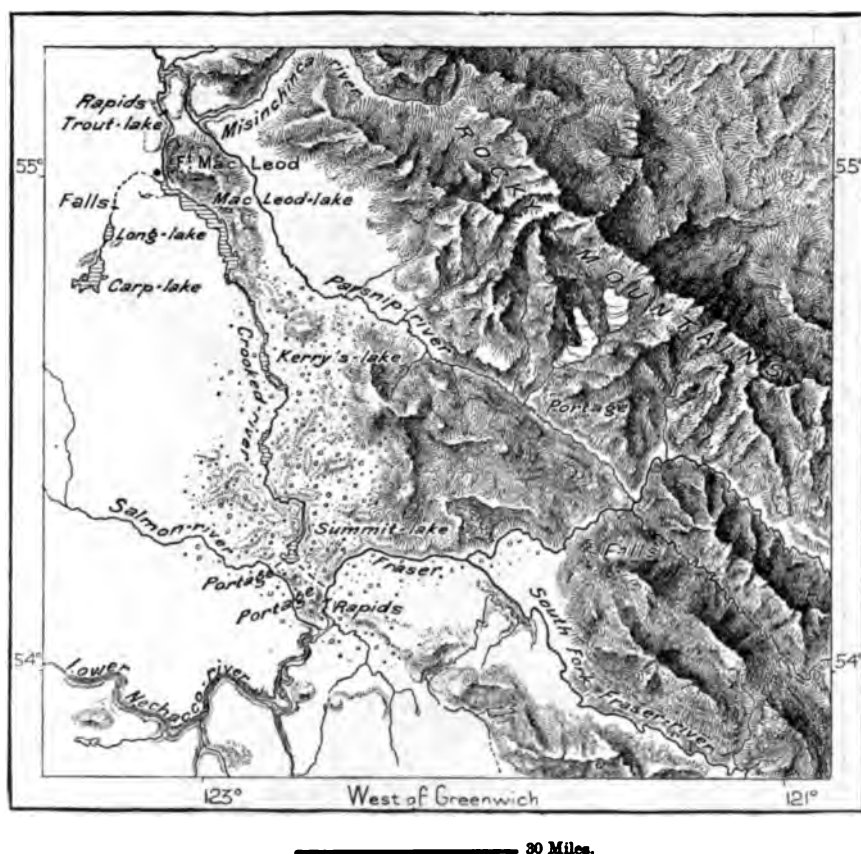


VIEW OF HELL-GATE GORGE, FRASER RIVER.

is joined by several of its upper affluents, such as the Bear, Willow, North Fraser and Stewart (Nakosla); this last, which is the largest of all, comes from the north-west highlands, and is fed by numerous lakes, all taking the form of long narrow basins. In its upper course the Fraser receives affluents converging almost from every quarter except the north; here, however, the Punais, or Parsnip River, flows

Fig. 66.—NORTHERN BEND OF THE FRASER.

Scale 1 : 1,700,000.



in the opposite direction, as one of the main headstreams of the Mackenzie. The fault in the terrestrial crust, occupied by the two water-courses, thus belongs to the same fissure; only it is inclined along two opposite slopes belonging to two different fluvial basins.

South of its great bend, the Fraser, flowing henceforth almost due south nearly to the coast, receives from the west the dark current of the Blackwater, and then from the east the more copious Quesnelle rising in the tortuous lake of the same name. Farther down it is joined from the west by the Chilcotin, an emissary from a lake near and parallel to Bute Inlet. In this part of its course the pent-up stream flows at a great depth between the mountains, and in many places it is impossible to follow its banks. Hence to ascend or descend its valleys, the traveller has to

scale the overhanging bluffs, or even to cross the lateral passes. Thus at the issue of the little lake Seton, near its west bank, the route till recently followed was deflected westwards, rising through a series of lacustrine terraces to Summit Lake,

Fig. 66.—SOUTHERN BEND OF THE FRASER.

Scale 1 : 960,000.



and thence turning southward in the direction of the Lower Fraser through another chain of partly navigable lakes. Summit Lake, which stands at an elevation of about 1,800 feet, presents the peculiarity of discharging its waters through two different channels into the Fraser.* Henceforth the transcontinental railway,

* R. C. Mayne, *Four Years in British Columbia*.

which descends to the Fraser through the valley of its eastern affluent, the Thompson, relieves travellers from the necessity of following the round-about route of Summit Lake.

The Thompson, after issuing from the winding basin of Lake Shuswap and collecting several large affluents from various directions, emerges on some broad grassy valleys, which have already been brought partly under tillage. But here and there it plunges into some gloomy gorges; of less formidable aspect, however, than the "dalles," or cañons, in which the Fraser contracts its bed below the confluence. The first miners attracted to the upper valleys in quest of gold have left graphic accounts of the dangers of this route, with its "hell-gates," before a carriage road and railway had triumphed over the obstacles by bridges, viaducts, and levellings. In several places the vertical walls rise 500 and even 1,000 feet above the stream, which rushes in a series of falls and rapids through these gloomy narrows. Many lives were lost in the attempts to ascend or descend the "Crazy River," as it was named by the miners, in reference either to its changeful moods, or to those who were mad enough to face such perils in their search of wealth.

The Fraser is really navigable only in its lower course, where it changes its direction from south to west. Here the mean depth is no less than 50 to 60 feet, and for over 30 miles above its mouth ships find good anchorage close to the shore, exposed only to the danger caused by snags drifting with the current or stranded on the sandbanks. The river is lowest during the first three months of the year; but with the melting of the snows in April it rises rapidly, by mid-summer reaching 50 feet in the cañons, and 25 to 30 below the narrows, and flooding the low-lying plains at its mouth. The sediment brought down with the current has encroached on the Gulf of Georgia, developing a marshy delta with constantly shifting channels. The "Sturgeon Bank," or bar, which half closes the mouth of the Fraser, presents no serious obstacle to navigation.

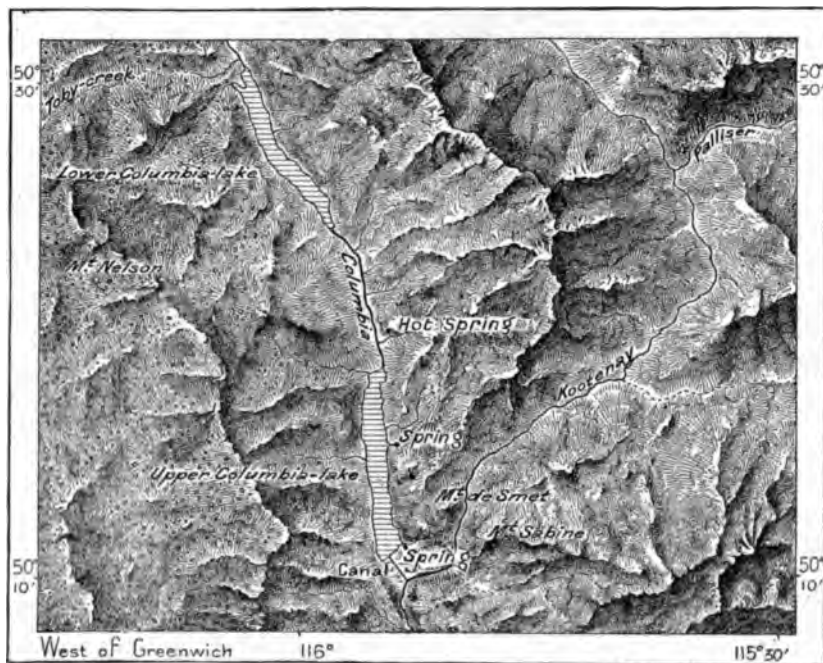
The United States having taken the lion's share of these western lands, Great Britain had to abandon the greater part of the Columbia basin, retaining only the upper valley as far as the confluence of Clarke's River. Thus the upland region enclosed between the two semicircles of the Upper Columbia and Kootenay lies all but its southern extremity within the Canadian frontier. Few geographical formations are more remarkable than this upland region occupied by the Selkirk Mountains, and encircled like an enormous fortress by a moat of navigable waters. The Columbia also presents the almost unique phenomenon of a river already fully developed at its very source. Expanding at once into a navigable lake it is separated from the Kootenay, here also navigable, only by a low isthmus 2,660 yards broad, through which a canal has easily been cut. The long depression which is traversed in opposite directions by these two rivers has obviously been sculptured by the same geological agencies. Dawson has shown that the general tilt of the valley was formerly in the direction of the south; it was in this direction that were transported all the erratic boulders and other glacial débris.

At present the Upper Columbia, alternately lake and river, develops a course of about 200 miles along the west foot of the Rocky Mountains; then, after an

abrupt bend, like that of the Upper Fraser, it trends also to the south, both rivers thus presenting the same disposition in their upper reaches. After forming the Upper and Lower Arrow Lakes, a continuous sheet about 100 miles long, the Columbia is joined by the Kootenay, the two streams, which almost touched at their sources, thus merging in one some 450 miles from their origin. In point of fact, the same fold in the Rocky Mountains, from the southern bend of the Kootenay in the United States to the Cassair district under 56° north latitude,

Fig. 67.—SOURCES OF THE COLUMBIA.

Scale 1 : 570,000.



is successively occupied by the Kootenay, Columbia, Fraser, Parsnip and other basins.

The changes produced in the level of the two rivers and their lakes are attested by the old water marks, visible at various elevations on the flank of the mountains, as well as in the Alaskan fjords, Cook's Inlet, and Prince William Sound. These parallel terraces, or "benches" as they are locally called, are one of the most general features in the relief of the land, and are numerous, especially in the Fraser and Columbia basins. In several districts they are disposed like the steps of a building, rising with perfect regularity to a height of nearly 4,000 feet, and in one place near the great northern bend of the Fraser to 5,250 feet. These benches are evidently of diverse origin, marine beaches, margins of lacustrine basins or river beds, according to the thousand oscillations of the ground.*

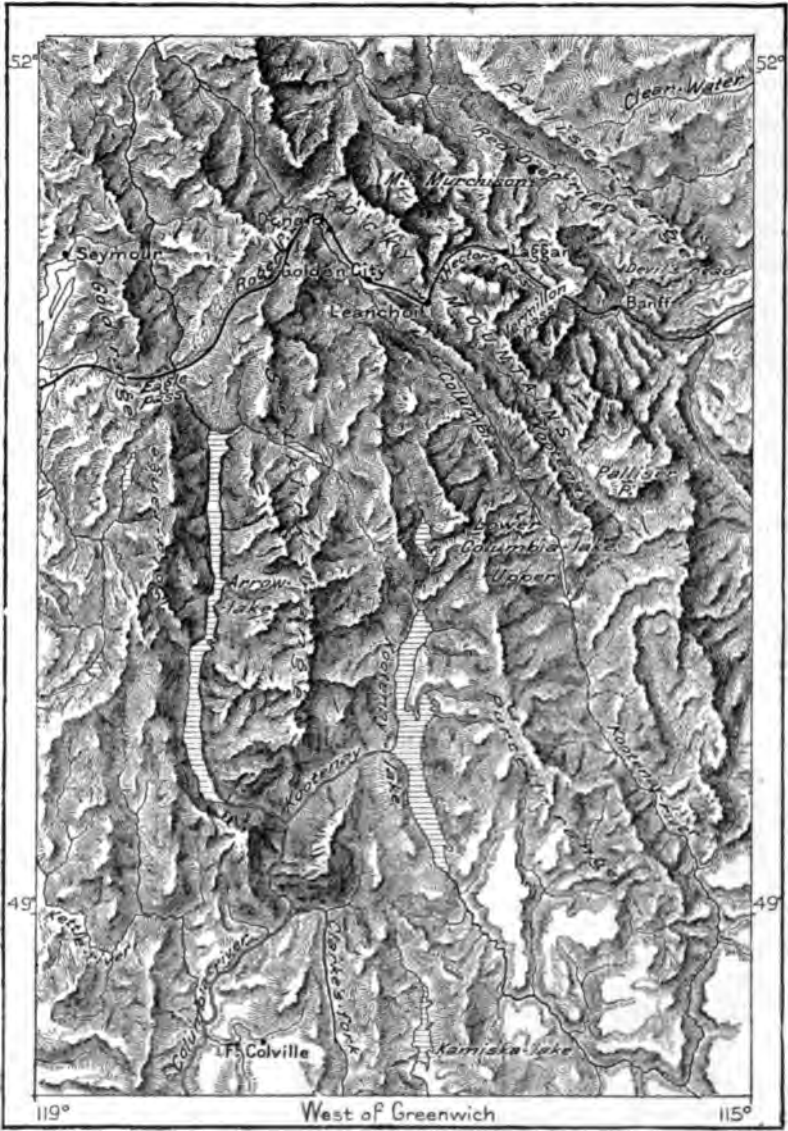
* G. M. Dawson, *op. cit.*

CLIMATE OF COLUMBIA.

The south-west angle of British Columbia, that is, where the mean temperature is highest, is intersected by the isothermal of 50° F., which corresponds to

Fig 68.—COLUMBIA AND KOOTENAY VALLEYS.

Scale 1 : 3,000,000.



that of Paris. But beyond this point the heat diminishes gradually northwards and eastwards, and at the north-east extremity of the province the annual isotherm falls to about 35° F., answering to that of Winnipeg. Under the

influence of the winds and marine currents the isotherms are deflected far to the north along the coastlands. Thus, instead of coinciding with the parallels of latitude, they run south-east and north-west, and on the northern seaboard even follow the coastline. By a strange anomaly, showing how little the climate at times depends on geographical position, the summer heats are greater in Vancouver Island than in California, as far south as Monterey, which is nearly 900 miles nearer to the equator. This curious reversal of the climatic conditions is due to the influence of the Japanese "Gulf Stream" on the west coast of Vancouver.*

But notwithstanding the mildness of the western and southern districts the climate of Columbia is in general inferior to that of Europe, the winters being longer and colder, the summers shorter and hotter. Winter begins usually in September or October, and lasts till May, and is marked by much snow, rain, frosts, and fogs. The inland lakes and rivers remain ice-bound for weeks together, and even the lower course of the Fraser has occasionally been frozen. The mean elevation of the land, scarcely less than 4,000 feet, tends to increase the rigour of its climate, which, however, is not the chief obstacle to its settlement. European colonies have been founded wherever the soil is productive, the moisture not excessive, and the communications easy.

Thanks to the general conformation of the country, the different regions all receive some share of the rainfall, although the contrast is great between the dry eastern slopes of the Rocky Mountains and the west side exposed to the moisture-bearing winds from the Pacific. In the south Vancouver acts as a sort of screen, receiving most of the rainfall on its western slopes, and leaving comparatively little for the east side and the opposite coastlands. In the north there are no islands large enough to intercept the supply, which is consequently almost entirely discharged on the uplands of the mainland.

FLORA AND FAUNA.

The vegetation corresponds to the distribution of the rainfall. In the southern and drier regions, the slopes are covered with bunch-grass, which makes such excellent fodder, and which contributes so much to the wealth of the colony. These pastures, on which the cattle graze throughout the year, ascend the hill-sides to a height of 3,000 feet, at which elevation much wheat is also grown. Most of the territory receives sufficient moisture to support a large forest vegetation, and in some places the woods are so dense and continuous that many of the early travellers speak of British Columbia as one vast forest.

According to Dawson, about two-thirds of the country is under timber, the prevailing species being the conifers, some of which acquire gigantic proportions. The yellow or Douglas pine, most valuable of the Columbian trees, in some places

* Temperature of New Westminster, South Columbia, 49° 12' north latitude :—

July, hottest month, 61° F. ; extreme, 88° F.

January, coldest month, 34° F. ; extreme, 16° F.

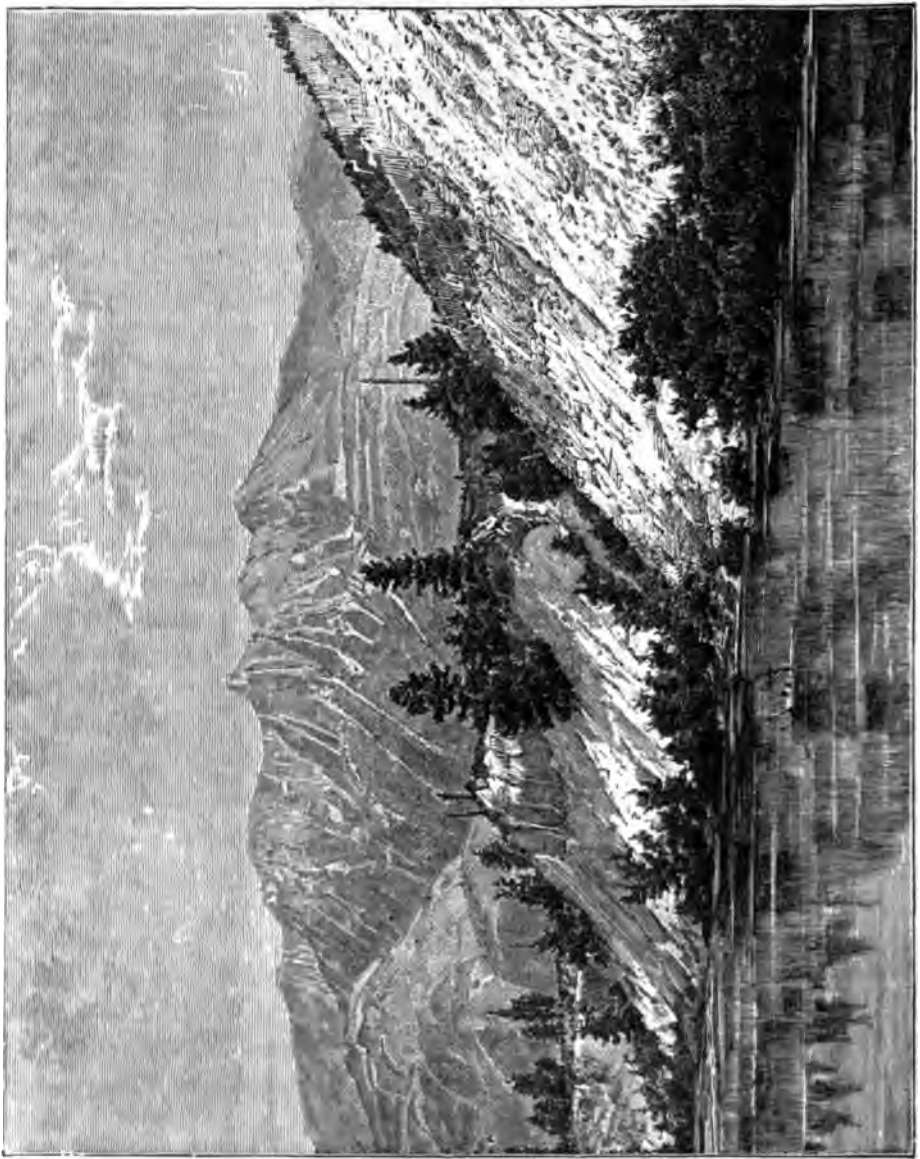
Yearly average, 47° F.

Annual rain and snow fall, 63 inches in 198 days.

grows to a height of 350 feet with a perfectly straight stem branchless for 100 feet. No timber excels it in strength, elasticity, and power of resisting extremes of temperature; it thrives especially in the southern districts and Vancouver Island. Another useful conifer is the *pinus Lambertiana*, which yields a sweetish resin, used by the natives instead of sugar.

The maples, poplars, and aspens, rival most of the pines in size, while the

Fig. 69.—VIEW TAKEN ON THE UPPER COLUMBIA.



arbutus becomes in Vancouver quite a forest tree. Columbia is especially rich in shrubs bearing edible berries, which are gathered by the natives, and even exported to San Francisco. All the vegetables of Central and North Europe thrive well, and most fruit trees yield excellent crops.

Large animals are somewhat rare, the formidable grizzly bear being seldom

seen except in the Rocky Mountains, while elsewhere the black bear alone is met. This variety never attacks man, and equally harmless is the puma (*felis concolor*), which ranges northwards to the Fraser Valley and Vancouver. The superb mountain sheep bounds from crag to crag on the rocky heights, and lower down the caribou (*rangifer caribou*) and wapiti frequent the grassy plateaux, plains, and islands, while deer abound, especially in the wooded islands along the coast. Wolves seldom leave the depths of the forest except in severe winters, and a few bison from beyond the Rocky Mountains are said still to roam over some of the grassy districts.

In Columbia are found nearly all the fur animals of Alaska and the Mackenzie basin—the marten, fox, beaver—and the sea otter is even said to survive on the north-west coast of Vancouver. On the other hand there are no venomous snakes, but several harmless serpents, regarded by the native hunters as a great delicacy.

The avifauna is represented by numerous families, including even several species of the humming-bird, which are seen flitting from bush to bush even before the snow has disappeared from the slopes of the hills. But in the number and variety of its fishes, British Columbia probably surpasses all other regions of the temperate zone. The marine inlets and rivers teem with salmon, trout, sturgeon, whitefish, herrings, sardines, anchovies, and many species unknown in Europe. The cod-bank off the south coast of Alaska is continued along the shores of Columbia, and the waters between Queen Charlotte and Vancouver islands are frequented by the “black cod,” whose flesh is said to be superior to that of the ordinary species. There are no lobsters, but crabs and prawns, as well as oysters and mussels, are found in great quantities. Such was the abundance of fish in the Columbian rivers in the early period of colonisation, that during the season, the banks below the falls were strewn with innumerable salmon, which had failed to surmount the obstructions. They were taken in hundreds and thousands with nets or casks, and even raked ashore. The hulakan, or “candle-fish,” is used by the Indians, as by the Alaskan Eskimo, for lighting their houses.

INHABITANTS OF BRITISH COLUMBIA.

British Columbia is scantily occupied by an indigenous population, broken into distinct tribes numerous in proportion to the vast territory over which they are scattered. They are estimated altogether at from thirty thousand to forty thousand, while the tribal groups are reckoned by the score, each with its distinct denomination, though often differing little from their neighbours in origin, appearance, or usages. Hence the impossibility of classifying these various groups according to their real affinities, or even according to their languages, of which most observers are profoundly ignorant. It is now, also, too late to study the extinct tribes, or those whose primitive features have been effaced by servitude and the demoralisation so often resulting from contact with Europeans.

In a general way the natives are divided into islanders, coastlanders, and inlanders, a classification to some extent based on social habits, some being fishers

or seafarers living on a fish diet, others hunters dependent on the produce of the chase. In the absence of any common national designation, the insular and coast tribes have been collectively grouped as "Columbians," a term also applied to the seaboard populations of Washington and Oregon in the United States. The inland peoples are in the same way called "Red-skins," or "Indians," and several are undoubtedly related to the prairie Indians beyond the Rocky Mountains. Still, they must often differ greatly in origin, or at least the dispersion must have taken place at very remote times, for there are few regions where the languages current amongst apparently kindred tribes present more profound differences.

A perfectly distinct family is that of the Haidas, who occupy the Queen Charlotte Archipelago, and nearly the whole of Prince of Wales Island, as well as the opposite Alaskan and Columbian coastlands.* The various clans take their names from the districts or rivers occupied by them—as, for instance, the Nasse, Skeena, and Bellacoola tribes. The Haida domain stretches eastwards to the Upper Fraser Basin, and may be estimated at about 30,000 square miles, with a population certainly less than fifteen thousand. In Queen Charlotte the natives, formerly numerous, are now reduced to less than two thousand. The Haidas are generally supposed to be more akin to the northern Thlinkits than to their southern neighbours, although the two languages are quite distinct.

Those who have not been degraded by European vices, are distinguished amongst all the western populations by their shapely figures, their strength, skill, graceful carriage, and regular features. Nevertheless, the prevailing type is still that of other American aborigines—broad face, prominent cheekbones, small sparkling eyes, shaded by overhanging superciliary arches. The women are very muscular, but as a rule less good-looking than the men, and till recently disfigured themselves by the hideous lip ornament so generally worn along this seaboard. Amongst some tribes, especially the Bellacoolas, the heads of the children are flattened, and till lately the custom prevailed of painting the body in colours, which changed with the different feasts and ceremonies. For the dance they wear animal masks and figures of quadrupeds, birds and fishes painted on the breast; but when excited to a pitch of frenzy, these Corybantes will often throw aside the mask and fall upon a dog, tearing it to pieces with their teeth and devouring the flesh. Formerly their fury was vented not on dogs but on men, who were treated in the same way to appease the spirit agitating them.

Before the arrival of the Europeans, a conspicuous object in the Haida villages was the chief's house, or assembly room, sometimes spacious enough to contain an audience of seven hundred persons. Some of the houses are decorated with wood carvings, or else, as amongst the Thlinkits, marked by "genealogical trees." The Haidas display great skill, especially in building and adorning their canoes, which are propelled with remarkable speed by means of shovel-shaped oars. The finest, made of cedar, are those of the Kaigani in the Prince of Wales Archipelago, who are renowned far and wide for their beautifully carved pipes, and other objects embellished with eccentric designs. Strange to say, the Queen Charlotte Haidas,

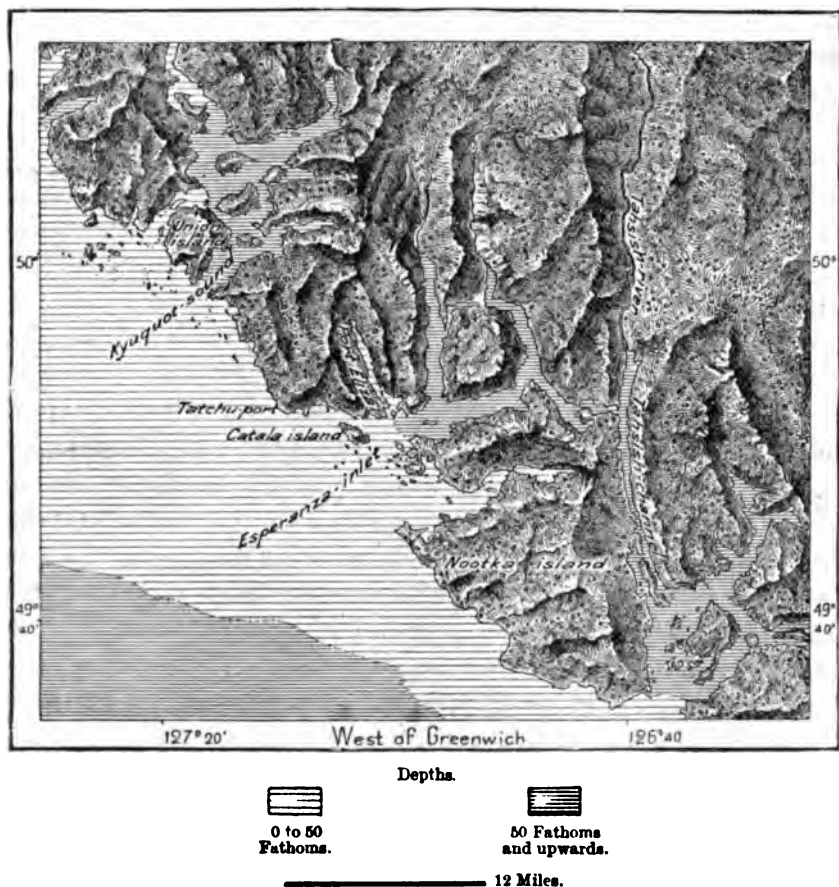
* G. M. Dawson, *On the Haida Indians of the Queen Charlotte Islands*.

who resemble the Polynesians in so many respects, are quite ignorant of the art of swimming.*

Power belongs to wealth, and many of the chiefs exercise a despotic authority. The nephew inherits from the uncle through the female line, and in many tribes matriarchal customs still survive. There are no settled laws, though the murderer who fails to pay the appointed fine is often put to death. Slavery exists either by purchase or capture, and the chiefs frequently immolate human victims at burials,

Fig. 70.—Nootka Island and Inlets.

Scale 1 : 7,650,000.



or to render incantations more efficacious ; for these chiefs are above all magicians credited with power over the spirits, whom they pretend to keep shut up in a mysterious box in order to have them always at their service.

Several of the Haida communities have been demoralised by drink and gambling; nevertheless some progress has been made, and the Queen Charlotte Islanders, formerly sea-otter hunters, have now become skilful agriculturists, exporting large quantities of potatoes to the coastlands. The Chimsyans of the Metla-Katla

* Fr. Poole, *Queen Charlotte Islands*.

district have also abandoned their old usages, and are now under the absolute sway of a missionary, at once king, priest, and general controller of the public property. These Christians, now dressed like Europeans, have recently been obliged to migrate northwards into Alaska in consequence of religious wranglings and commercial rivalries between their theocratic master and the English traders.

The Nootkas of Vancouver and the opposite coast have been so named by Cook for no apparent reason, the term being unknown to the natives themselves. Several of the Vancouver tribes are collectively called Ahts, from the ending of

Fig. 71.—OLD NOOTKA-INDIAN WOMAN.



the special names borne by them. On linguistic grounds the Nootkas might be grouped in four distinct families; but they are usually named from the districts they inhabit. They are on the whole more robust than the Haidas, with shorter figures and less expressive features. The oblique eye, flat beardless face, and yellow brown complexion give to some a strikingly Chinese appearance. Before the arrival of the Europeans the heads of the children were flattened and the crown compressed to a point by means of cloth and bark bandages. The head of a young girl measured by Mayne towered no less than eighteen inches above the eyes.*

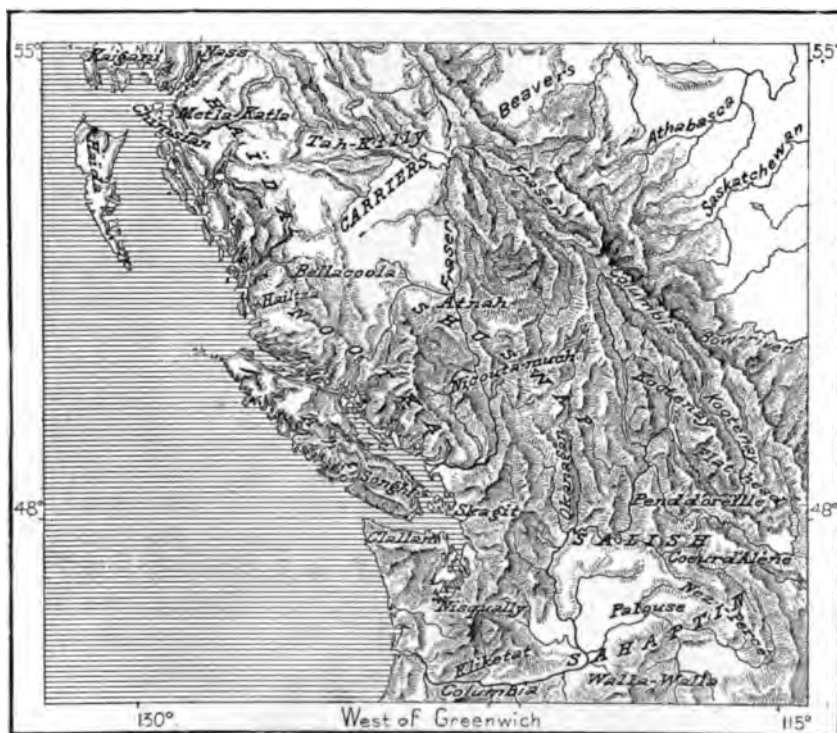
* *Four Years in British Columbia and Vancouver Island.*

Traces of matriarchal institutions survive amongst the Nootkas ; the wife is regarded as equal to the husband, and in case of divorce has the right not only of taking her personal effects, but even keeping a share of the common property. The medicine-men still retain much of their baneful influence, though they no longer excite to those scenes of massacre and cannibalism described by the early travellers. As amongst the Haidas the dead are usually cremated, but also occasionally deposited in hollow tree trunks, or on raised platforms, sometimes decorated with symbolic figures representing the totem of the clan.

The Nootkas have shown themselves very obdurate to missionary teachings ;

Fig. 72.—ABORIGINES OF BRITISH COLUMBIA.

Scale 1 : 13,000,000.



the few that have accepted Christianity are treated as outcasts, and if not actually killed are allowed to die of hunger. Many of those formerly occupying the sites of European settlements hang about the outskirts of the towns, where they become thoroughly debauched and are soon carried off by drink, disease, and misery. In their intercourse with strangers the Nootkas speak the Chinook jargon, so named from the powerful tribe living farther south in United States territory. This *lingua franca* comprises about 550 words, including, besides Clinook, several English, French, and even Polynesian terms.

Through imperceptible transitions the Nootka type merges in that of their

eastern kindred, the Columbians, who are collectively known as Shuswaps from the lake situated about the centre of their territory. The Shuswaps are subdivided into numerous septs, such as the Nicouta-mush (the "Couteaux" of the Canadian trappers), who occupy Lake Shuswap and its affluent, the River Thompson; the Atnahs, or "Strangers," of the Fraser Valley above the gorges; the Kootenays, so named from the river sweeping round the southern extremity of the Selkirk range. The Shuswaps, and especially the Kootenays, contrast favourably with the Columbians of the seaboard by their more muscular frames, graceful figures, and noble carriage. They keep no slaves and are generally more hospitable, frank, and valiant than their western neighbours. Unfortunately, this nation was exposed to the first rush of the gold-hunters, the sudden irruption being followed by the spread of epidemics, the extinction of several clans and general demoralisation.

In the north-eastern districts of British Columbia dwell the true Red-skins of Athabaskan stock, akin to those who roam the plains east of the Rocky Mountains. From the Canadian trappers they have received the well-earned name of *Porteurs*, the "Carriers" of English writers. One of their tribes, the Tah-killies, who occupy the plains between the great bend of the Fraser and the Peace River, are closely related to the "Beavers" residing beyond the Rocky Mountains. Like certain Yukon peoples, the Carriers burnt their dead, the widow being obliged to pass her hand several times over the breast of her husband, after which she was doomed to serve his family for one or more years before laying aside her mourning.

On the lower Fraser begins the domain of the Salish, Sahaptin, Skagit, Chinook, and other Indian tribes, whose territory stretches far into the United States. The special names of these people terminate in the syllable *tin*, corresponding to the word *tinneh* or *déné*, that is "men," which is applied collectively to the Indians of Alaska and the North-West territory.

RESOURCES OF BRITISH COLUMBIA.

The white population already outnumbers the aborigines more than three times, and the discrepancy is steadily increasing from year to year. At present the white element is estimated at over 100,000, nearly all of British or American origin and of Anglo-Saxon speech. They have been followed by the Chinese, who will probably monopolise certain industries, unless some repressive measures be adopted, as in California and Australia. The colonisation of British Columbia began scarcely fifty years ago, and was largely due to the "gold fever." Although the Indians had long collected small quantities, the discovery of extensive deposits was not made till the year 1856, first on the banks of the Fraser, and then in the Thompson valley. Miners were immediately attracted from California; fresh discoveries were made, and in 1858 occurred the great rush.

All the Columbian rivers, without exception, send down auriferous sands, though not in sufficient quantities to cover the working expenses. At first the

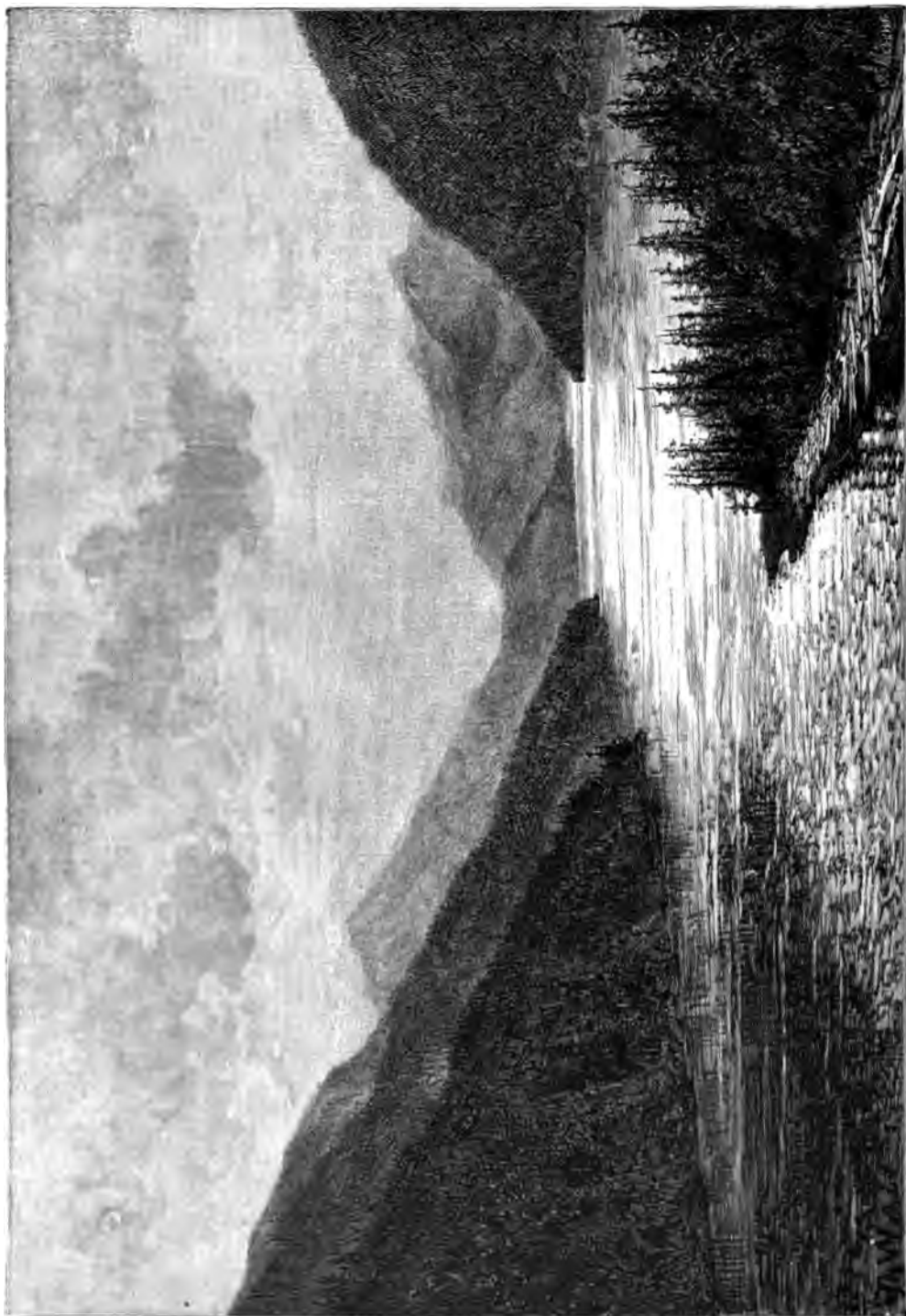
largest quantities were yielded by the Lower Fraser and Thompson districts; then followed the Caribou region, south of the great bend of the Fraser; after which the miners pushed north towards Gardner Channel, the Skeena basin, and the valley of the Omineca, a tributary of the Peace River. Lastly, in 1872, the stream was directed by the discoveries of Thibert and MacCulloch towards the Cassiar Country, between the Stickeen basin and the Liards River, near the Alaskan frontier, where a few patient gleaners, chiefly Chinese, still linger. During the first years the Columbian mines yielded from £800,000 to £1,000,000 annually, rising in 1861 to £1,400,000. At present many of the grounds are exhausted, the miners have disappeared, and the total yearly output varies from £120,000 to £200,000. The total yield from 1858 to 1888 is valued at £11,240,000. Columbia also possesses some productive deposits of native silver.

The general conformation of these highlands shows that the gold is here distributed in the same manner as in California, and the workers are accordingly able to profit by the experiences of their precursors. In the districts where they have not yet been expelled, the natives are employed on most of the laborious operations. Other mining industries, such as that of bituminous coal, have also acquired considerable importance. From the first days of the colonization passing steamers were supplied with coal from Vancouver. Then mining operations were systematically developed, and at present many villages look like suburbs of Newcastle, with their heaps of shale, their lifts and machinery. The pits, situated, so to say, on the very quays of the seaports, already yield enough to support an export trade. But the anthracite on the banks of the Skidegate Channel, in the Queen Charlotte Archipelago, has not yet been regularly worked, although said to be equal to that of Pennsylvania.

Stock-breeding, especially for the Californian market, is also acquiring a considerable development, while the fisheries yield abundance of excellent salmon tinned on the spot, and exported in yearly increasing quantities. Capitalists have also begun to work the vast forests of the coastlands, and a brisk lumber trade has already been established.

TOPOGRAPHY.

Of no other region can it be said with greater truth that a single railway constitutes its vital artery. But for the trunk line traversing it from east to west, British Columbia would be cut off from the commercial world, except at a few isolated points along the seaboard; nor could it maintain any direct relations with the Dominion of Canada. The first whites who settled in the country nearly all reached it from California, and when the rush of miners was directed towards the new Eldorado, most of the precious metal was shipped to San Francisco. From year to year the communications with the States became more direct and continuous. Despite the political ties, Vancouver and the neighbouring settlements became more and more associated with the great republic, and the British Government had reason to fear that this remote colony might, by the very force of events, inevitably become a political dependency of San Francisco.

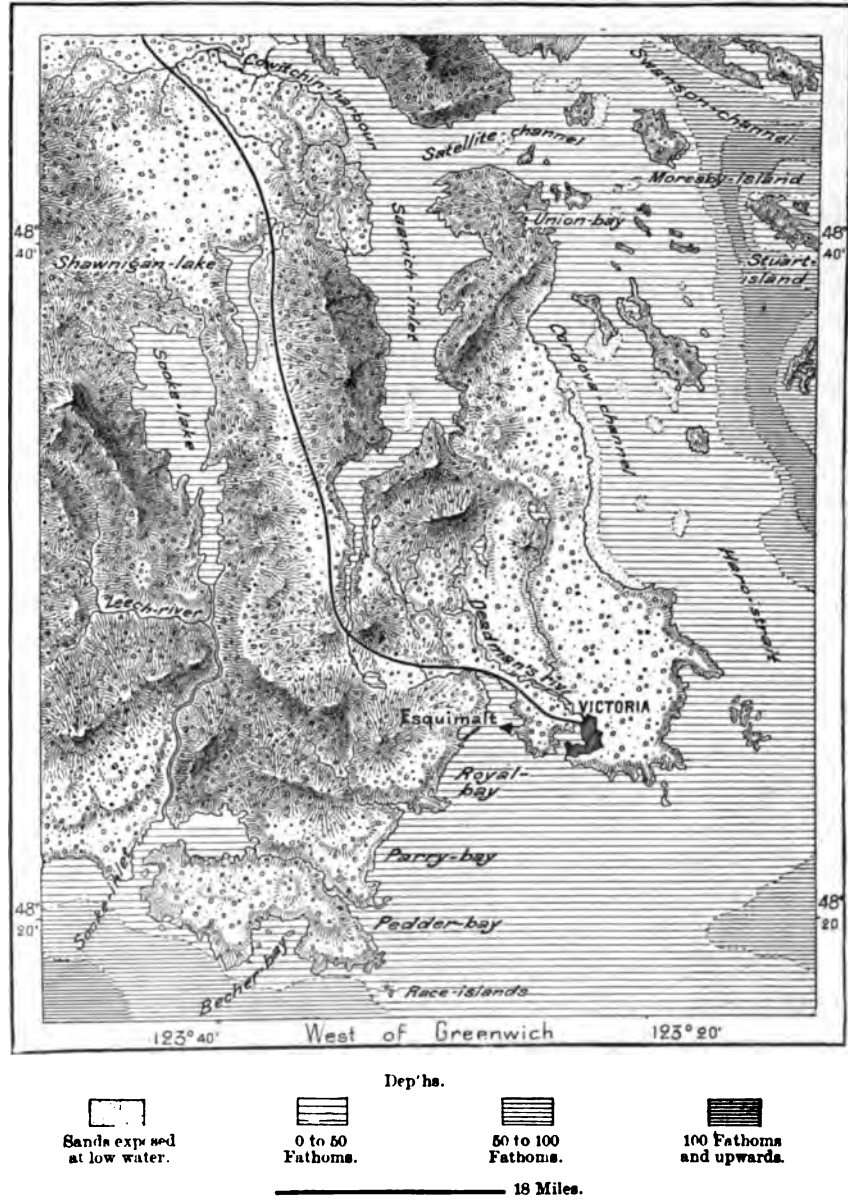


VIEW TAKEN IN GARDNER CHANNEL



To counteract this current it was found indispensable to connect the St. Lawrence and Fraser basins by a rapid line of communication, although considerations of economy naturally delayed the execution of this costly project. When it

Fig. 73.—VICTORIA AND ESQUIMALT.
Scale 1 : 650,000.



joined the Dominion of Canada in 1871, British Columbia exacted the condition that a trans-continental railway should be constructed across the Rocky Mountains by the year 1891. But such was the urgency of this work that the company,

aided by the liberality of the Canadian Government, was able to complete the line from ocean to ocean in 1886. All the centres of population and traffic naturally gravitated towards this great artery, which traverses the Lower Fraser valley to its mouth over against Juan de Fuca Strait and Puget Sound.

Vancouver Island, lying south of the Queen Charlotte group, nearer to the mainland, and opposite the excellent harbours of the inland waters, was sure to attract the attention of the early colonists. Nevertheless, very little of the country has been settled, and not more than 15,000 acres were under tillage in 1884. The first arrivals came by the sea route, and grouped themselves round a station of the Hudson Bay Company, which is supposed to be the *Cordoba*, or *Camosin*, discovered in 1790 by Manuel Quinipe, at the south-east corner of the island opposite Puget Sound. On the discovery of gold in the Fraser basin, *Fort Victoria*, as the factory was named by the English settlers, became the rallying-point of speculators and miners flocking from California. Within a twelvemonth, as many as 30,000 persons were crowded round the station in log huts or under canvas, and a regular town rapidly sprang up, with fine thoroughfares crossing each other at right angles, squares, quays, and harbour works. At present Victoria is a pleasant little English town, adorned with shady walks, a beautiful park, and a reservoir abundantly supplied from a lake six miles off. The bay is bridged by a handsome viaduct, and several avenues lead north-west to the well-sheltered port of *Esquimalt*. Here the British and Canadian Governments have constructed an arsenal and dockyards, and both places are connected by frequent steam service with Alaska, California, and the opposite coast. Victoria will also, sooner or later, form the terminus of the transcontinental railway, which is to cross the Seymour Narrows by a long viaduct, and then traverse the channels of Valdes and other islands, reaching the mainland at Bute Inlet, and penetrating inland through the Homathco and Chilcotin valleys.

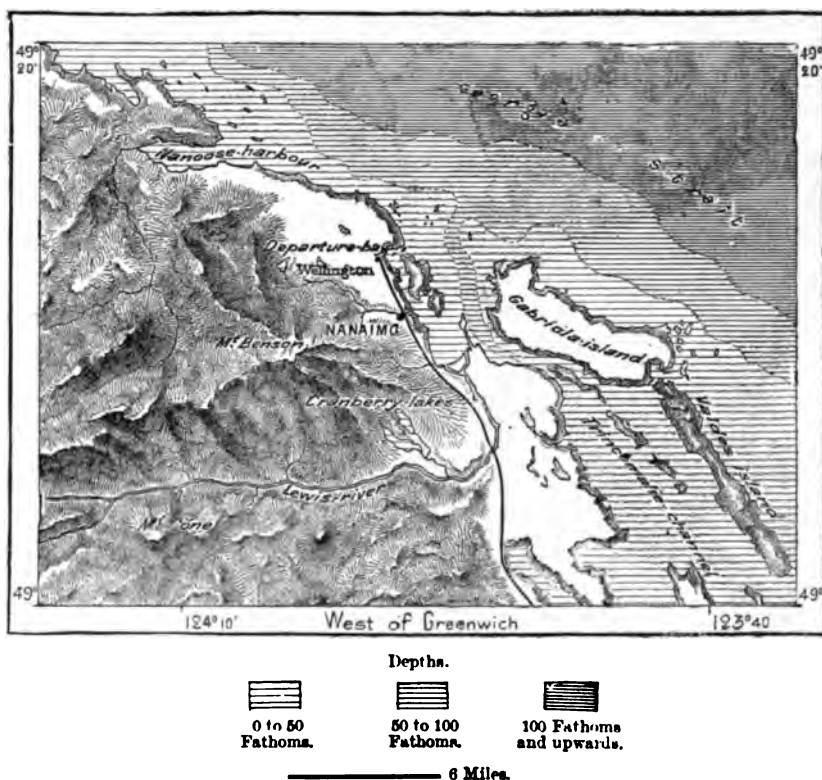
A branch of this projected line already connects Victoria with *Nanaimo*, which lies 70 miles north-west on a good harbour, and in a district yielding the best coal on the Pacific seaboard. This coal is exported to China, the Sandwich Islands and California, and also supplies the British squadron stationed in these waters. The mines are reached by a shaft over 650 feet deep sunk in the very centre of the town, and giving access to galleries which run a great distance under the ground and neighbouring Gulf of Georgia. Nearly a thousand hands were at work in these galleries when a sudden explosion of fire-damp destroyed 149 miners, and since then the pits have been almost abandoned. But those of *Wellington*, a little farther north, are actively worked by a Belgian company. Other coal-fields occur towards the middle of the east coast, and industrial populations must soon be attracted to these deposits, which are conveniently situated for smelting the excellent iron ores found in Texada Island.

The Queen Charlotte Archipelago is also one of those Columbian regions which, thanks to its mild climate, fertile soil, and geographical position, might become the centre of a considerable population. Yet it has hitherto been almost entirely neglected by European settlers. Discovered in 1774 by Juan Perez, its insular

formation was first determined by the American trader, Grey, in 1789. Since then it has been frequently visited by trappers, while its geology, natural history, and ethnology have been carefully studied by G. M. Dawson, the chief scientific explorer of the Canadian "Far West." But the first white colonists only made their appearance since the rush to the Columbian goldfields. Here also some auriferous sands have been found, but nowhere in sufficient abundance to establish a regular mining industry.

Missions have been founded on the coasts of the Queen Charlotte group, notably of *Masset*, on an inlet which ramifies in a series of lakes far into the

Fig. 74.—NANAIMO.
Scale 1: 500,000.



interior of the northern islands. On Skidegate Channel has been established an important factory for extracting the oil of the dog-fish. But the white population increases very slowly in the Archipelago, while the native Haidas are disappearing in still more rapid proportion.

On the mainland itself every fjord has its trading station, its fisheries and tinned provision industries. In the Stickeen Valley the most flourishing place is *Glenora*, situated at the head of the navigation 130 miles above the estuary. *Fort* or *Port Simpson*, in Chimsian Island, is not a military post, but a market frequented by various Indian tribes. *Hazleton*, at the head of the navigation on the Skeena river, is the chief resort of the miners engaged on the Onimeca gold-

fields, and *Port Essington*, near the mouth of the same river, has acquired some importance as a fishing and trading station.

In the valleys of the Upper Fraser and its affluents there are scarcely any centres of population, and *Lilloet*, on a terrace overlooking the Fraser, has even

Fig. 75.—QUEEN CHARLOTTE ISLANDS.

Scale 1 : 2,100,000.

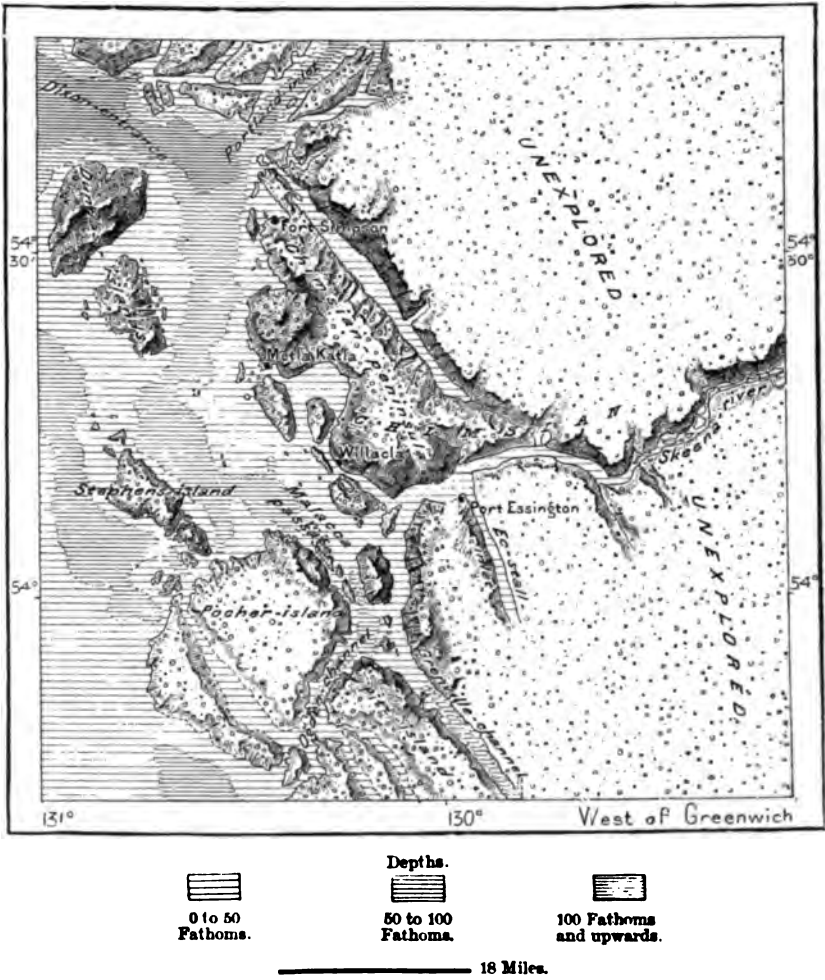


diminished in size since the abandonment of the route which through Summit Lake connected the middle course of the river with its delta. *Kamloop*, "metropolis of the interior," stands at an elevation of 1,140 feet at the confluence of the two forks of the Thompson, whence its name, meaning the junction of

two streams. This section of the Thompson is navigated by steamers, and numerous herds graze on the surrounding pastures.

Lytton, at the confluence of the Fraser and Thompson, is too confined by the river gorges to develop any great commercial activity. *Yale*, at the southern entrance of the cañons and rapids, and at the head of the fluvial navigation, was at one time a busy centre of the mining industry, and a few Chinese still wash the

Fig. 76.—CHIMSIAN ISLAND.
Scale 1 : 1,200,000.

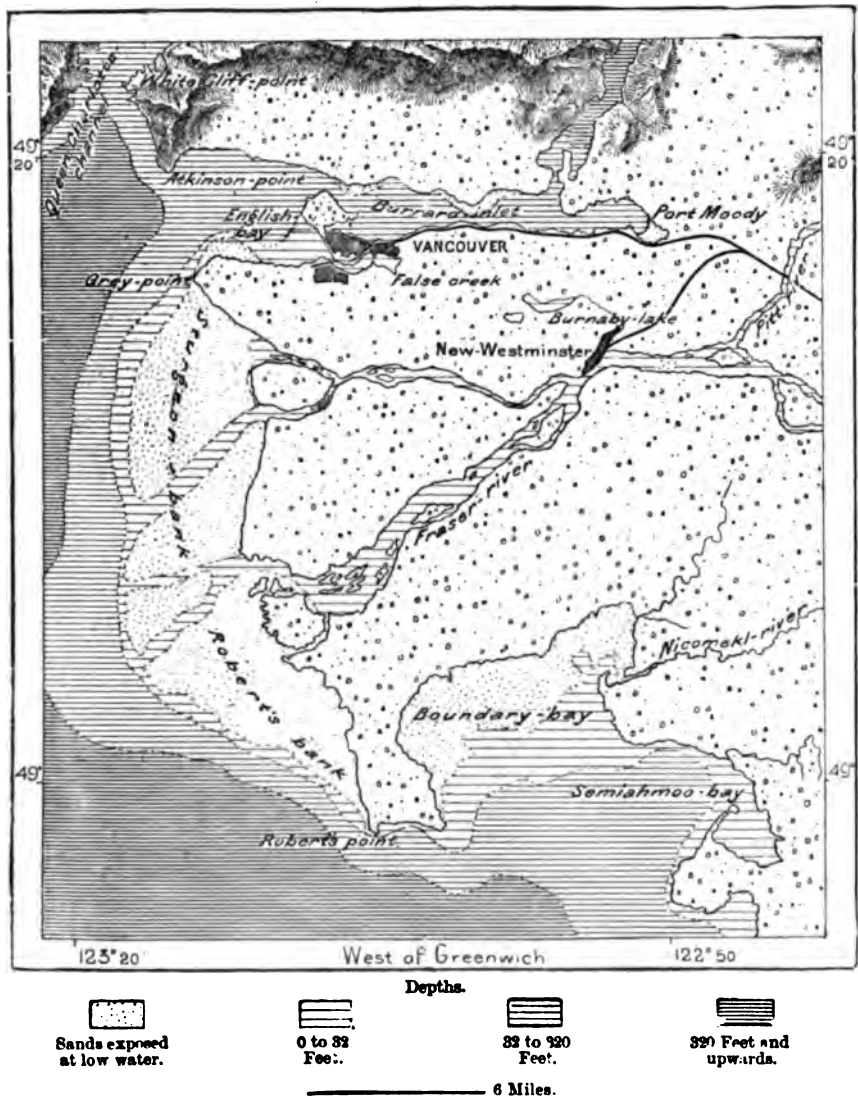


sands for gold. Here begins the romantic route which winds through the uplands in order to avoid the impassable gorges of the Fraser. Then follow *Hope*, till recently a mining centre; *Agassiz*, the nearest station to the famous sulphur springs of *Harrison*; lastly near the estuary *New Westminster*, which for a time ranked as a capital, and still retains some public buildings. Here are grouped the dockyards, sawmills, and “salmonries” of the Lower Fraser, and here will be constructed the viaduct across the Fraser, which is to connect the Canadian trunk

line with the Oregon and California railway systems. Westminster is connected by a daily service of steamers with its fluvial port of *Vancouver*, which has become the Pacific terminus of the transcontinental railway on Burrard Inlet. The first terminal station was erected at the head of this inlet on the spot still indicated by

Fig. 77.—MOUTHS OF THE FRASER.

Scale 1 : 445,000



the little village of *Port Moody*; but the railway was afterwards pushed farther west to *Vancouver* on a little creek well sheltered by a peninsula projecting in the form of a fishing hook.

In May, 1886, the spot where now stands this flourishing town, was still covered by dense forests; but the buildings sprang up as if by enchantment, and when all but one were consumed by a raging fire, *Vancouver* again rose rapidly



GENERAL VIEW OF VANCOUVER



from its ashes. Unlike any other Canadian settlement, it was a large place from the very first, and as soon as its name was heard in Europe it was already a great commercial centre of British North America. Its regular streets cover a space large enough to accommodate a population of 100,000; it possesses several public monuments, banks, churches, and hotels; its thoroughfares are lit with gas and electricity and it is well supplied with good water from the hills lying north of Burrard Inlet. Railways branch off to the north and south of the city; bridges cross the estuary of False Bay running to the south and parallel with Burrard Inlet; quays, pontoons, and warehouses have been erected; the transcontinental line is continued by steamer to Vancouver Island, Oregon, California, Alaska, Japan, and China, and other lines are projected towards New Zealand and Australia. Vancouver has thus at a stroke become the chief station on one of the great trade routes encompassing the globe. A fine park, 1,000 acres in extent, occupies the north-western peninsula, which half closes the entrance to the port and completely shelters it from the west winds.

III.—NORTH-WEST TERRITORY.

ATHABASCA-MACKENZIE AND GREAT FISH RIVER BASINS.

With the exception of Labrador the great division of the Dominion draining to the Arctic Ocean is less known than any part of British North America. The Mackenzie basin has doubtless been traversed in various directions; but it has been studied only along the line of widely distant itineraries. Consequently many of its geographical features have yet to be determined with precision, as is evident from the numerous discrepancies occurring even on the most recent maps. A century has elapsed since the whole region was traversed for the first time. Doubtless the Canadian trappers had penetrated far beyond the permanent European settlements; but none of them appear to have advanced northwards beyond the sources of the Athabasca. It was surprising enough that solitary traders could have ventured even so far beyond the extreme posts held by the whites, passing from tribe to tribe in the midst of enemies or doubtful friends, and making their way through forests and across innumerable lakes, rivers, and portages hundreds of miles from their base of supplies. The young Canadians, whether whites or half-breeds, took pride in plunging into these formidable western solitudes, and returning inured to every hardship, accustomed to face all dangers. Such a training made men, and to it may largely be due the tenacity with which the French Canadian nationality has held its ground in the midst of the Anglo Saxon world.

PROGRESS OF DISCOVERY.

The first purely geographical exploration was that of Samuel Hearne, despatched in 1770 by the Hudson Bay Company northwards in the direction of the Arctic waters. After pushing westwards to the Athabaskan basin Hearne reached the shores of the Frozen Ocean; but the account of his voyage remained in the

possession of the company for twenty years, when it was at last published in compliance with a promise made to Lapérouse. A few years after Hearne's expedition the Beaulieu family, Canadian half-breeds, founded a settlement north of Lake Athabasca, and in 1778 a fort was erected on its margin. Then Pond, an Englishman, guided by these half-castes, advanced to the Great Slave Lake, and seven years later Mackenzie descended the course of the river which bears his name, and thus reached the shores of the Arctic Ocean, which he supposed to be the Pacific. The following year he again penetrated into the same basin and after ascending the Peace River crossed over to the western slope of the region now known as British Columbia. Thus was opened a first transcontinental route across North America.

This memorable expedition was followed by others in the same direction; but no record was preserved of these voyages made in the service of the two rival companies, that of the "North-West," heir to the Old French Association, and that of "Hudson Bay." Both alike employed French and Scotch whites and half-breeds; but their resources were chiefly employed in thwarting one another, in stirring up feuds between their respective Indian subjects, in seizing their opponents' factories and taking possession of the routes and portages. Geographical studies were not furthered by these underhand struggles, which more than once broke into open hostilities. After Mackenzie's expedition no great voyage of discovery was undertaken till 1820, when Franklin traversed the north-west territories between Lake Winnipeg and the Arctic Ocean. Five years later he descended the Mackenzie to its mouth, and carefully surveyed the delta, while his companions, Back and Richardson, explored the regions stretching eastwards to the Coppermine River.

A few years later Back resumed his polar explorations, and discovered the source and the mouth of the Great Fish River, or Back's River, as it is sometimes called. Afterwards Dease and Simpson coasted the shores of the Frozen Ocean between the Mackenzie and Back estuaries, and when Franklin and his companions were lost among the Arctic lands, this region was traversed in various directions by search parties under Rae, Richardson, Pullen, Hooper, Anderson, Stewart, Hayes and Schwatka. Catholic missionaries, notably Petitot, also contributed to a better knowledge of the Mackenzie and other rivers flowing to the polar seas.

The official limits of the North-West Territory bear no relation to its physical features, and in any case have only been laid down provisionally in anticipation of further changes. In this enormous region the single province of Athabasca has alone been constituted, its frontiers, as is so often the case in America, being traced in geometrical lines along the degrees of latitude and longitude, except on the east side, where they partly coincide with the course of the Athabasca and Great Slave Rivers. But beyond this district, the territory officially comprises the whole section of the Rocky Mountains between Alaska and British Columbia, as well as the vast spaces extending north to the Arctic Ocean and east to Hudson Bay.

PHYSICAL FEATURES.

Including the not yet organised province of Keewatin in the south-east, the North-West Territory with the polar archipelago comprises more than half of all the lands constituting the Dominion of Canada. But if the country be taken within its natural limits, that is, leaving to Alaska the Yukon basin, and to Manitoba the tracts draining to Hudson Bay, all the Canadian lands whose waters flow to the Frozen Ocean present an area of about one million square miles, or nine times that of the British Isles. Yet the whole population, whites, Indians and Eskimo, scarcely exceeds fifteen thousand; in other words, this region is still almost uninhabited.

This vast triangular space sloping towards the Arctic Ocean is intersected by the chain of lakes running from the Canadian "Mediterranean" to the Great Bear Lake parallel with the axis of the Rocky Mountains and the west coast of the continent. This chain of inland waters forms a parting line between two quite distinct regions. So early as 1823 the American explorer, Long, traversing districts far to the south of the Mackenzie, had noticed the remarkable fact that the lacustrine depression coincides with the line of contact between two different geological formations, and the same remark has since been extended to the other great freshwater basins of British America. On the east the rocks consist uniformly of crystalline masses, on the west of far more recent sedimentary strata. The aspect of the country corresponds to the nature of the soil, the gneiss and granite formations being studded with innumerable cavities of all sizes forming meres, tarns or wooded lakes, while the stratified rocks of the west constitute rolling prairies disposed at a comparatively gentle incline.

On the west side the eastern slopes of the Rocky Mountains occupy a considerable part of the North-West Territory, and some of the advanced spurs even rise in isolated groups above the undulating plains extending east of the main range. Moreover, a number of eminences, which here and there develop into ridges, branch off from the Rockies in the direction of the Arctic Ocean. These "ribs" of the spinal axis, disposed for the most part in parallel lines, are pierced at intervals by the emissaries of lakes which were formerly pent up, but which by long erosive action have gradually found an outlet seawards.

One of these transverse ridges begins with the Bighorn group immediately east of the headwaters of the Athabasca, and forms the watershed between that basin and the Saskatchewan. Towards the sources of the Churchill, or English River, which flows to the Hudson Bay, the ground falls between that basin and the Clearwater, an affluent of the Athabasca, and here is the famous La Loche or Methy Portage, formerly crossed by all travellers proceeding to the north-west. It consists of a long sandy plateau about 1,550 feet high, or nearly 600 above the plains sloping towards Lake Winnipeg. Between this lake and La Loche, regarded as the common limit of two distinct territories, there occur as many as thirty-six other portages where boats have to load and unload.

A second line of hills branching from the main range north of the sources of the

Athabasca rises to a height of from 2,600 to 2,800 on the shores of the Lesser Slave Lake, and then trends northwards across the course of the Peace River, by which it is pierced through a series of falls and rapids. The various sections of the

Fig. 78.—DISPOSITION OF THE CANADIAN LAKES.

Scale 1 : 30 000,000.



chain are known as the Raspberry, Birch and Bark Hills. Then follows the Caribou range, forming the divide between the Peace and Hay Rivers, and crossing the main watercourse between the Athabasca and Great Slave Lakes. Other sandstone and calcareous chains running in the same direction rise beyond

the Great Slave Lake to heights of over 1,000 feet, and near the ocean attain an altitude of over 5,000 feet.

In this region the Rocky Mountains, or at least a range belonging to the same orographic system, approaches the Mackenzie, and here forms the waterparting between the Yukon and the rivers flowing to the Arctic Ocean. According to Petitot masses of phonolith abound in these northern mountains, and several cones near the east side of the Mackenzie delta at a distance resemble heaps of scorïæ; MacClure reckoned as many as fifteen emitting wreaths of smoke and by him compared to "limekilns."

In several districts are met small cones similar to the *maccalube* of Sicily, and occasionally emitting smoke, whence their Canadian name, *boucanes*. When in a state of activity they deposit sulphur, salt and other chemical substances along the course of their rivulets, and diffuse an odour generally like that of petroleum. They usually occur on the banks of rivers in the neighbourhood of bituminous schists, lignites and saline rocks. Elsewhere a huge bed of porous sandstone, saturated with mineral oil, burns like coal, and salt is found especially amongst the hills west of the Mackenzie, where, according to the natives, whole mountains are composed of rock salt. On the other hand the granites in the eastern region between the Arctic and Hudson Bay basins, contain deposits or traces of gold, silver and especially copper. So early as 1715 copper ores had been procured by the agents of the Hudson Bay Company from the Coppermine district.

A process of upheaval appears to have taken place along the Arctic seaboard, unless the ocean has here receded northwards. West of the Coppermine estuary Franklin collected driftwood at an elevation far above the present sea-level, and the same phenomenon was observed by Richardson on the west side of the Coppermine basin. On both sides of this river old marine inlets have been observed, which are now severed from the open sea by low beaches and narrow strips of sand. Eskimo Lake near the Mackenzie delta would seem to be such a formation, its water still being somewhat brackish.* But according to Petitot the Sitiji, as this lake is called by the natives, is merely an expansion of the small river Natowja, which reaches the coast east of the Mackenzie.

RIVERS AND LAKES.

The Athabasca, main upper branch of the Mackenzie, has its southernmost source in the so-called "Committee's Punch-bowl," a lakelet situated on the east flank of Mount Brown in the Rocky Mountains. On the opposite side of the Yellow Head Pass, the streams flow west to the Columbia basin, and north-west to the Fraser, while the Athabasca, or Whirlpool River, escapes from the hills north-eastwards, and is soon joined by several affluents such as the Miette, Baptiste, MacLeod, and Pembira. But the hydrographic nomenclature of this region is in a very confused state, every watercourse being differently named by the English, the Canadian trappers, and the various local Indian tribes. The term Athabasca

* John Richardson, *Franklin's Second Narrative of a Second Expedition to the Polar Seas*.

itself is rarely used, the Canadians calling it the *Biche*, a term which they also apply to other rivers. But according to Petitot, the Athabasca is wrongly named the Elk River on some English maps, for the animal formerly called the *biche* by the Bois-Brûlé trappers is not the *elk* of English writers, but the *ucapiti*, or "reindeer of the rocks."

From the west the Athabasca receives the drainage of the Lesser Slave Lake, as well as the overflow of several other lakes. Beyond a gorge cut through the sandstone rocks to a depth of over 300 feet, its valley broadens out, and in several places is studded with those extinct or still active "boucanes" which are numerous especially in the basin of the Mackenzie proper. At the foot of the Bark Mountain, the Athabasca traverses the "Great Rapids," a perfectly uniform inclined plain about 60 miles long, where the water is uninterrupted by a single fall, and its smooth surface ruffled only by rocks of various size projecting above the surface.

Some 550 miles from its source, the Athabasca enters the large lake of like name, at a point a considerable distance from its former mouth. At present the alluvial delta extends about 30 miles towards the north-east, and is intersected by a multitude of channels, which change their direction and relative size with every fresh inundation. The chief branch retains the name of Athabasca, and another is known as the "Rivière des Embarras," owing to the numerous snags washed down with the stream. The delta is also joined by channels from the Clear Water and from the Peace River, and in some years, notably 1871 and 1876, its whole surface has been transformed to a shallow muddy bay. The former herbaceous vegetation of the islands has been replaced by conifers, and the term Athabasca, meaning in the Algonquin language, "grassy carpet," and doubtless originally restricted to the deltaic region, has lost its significance.

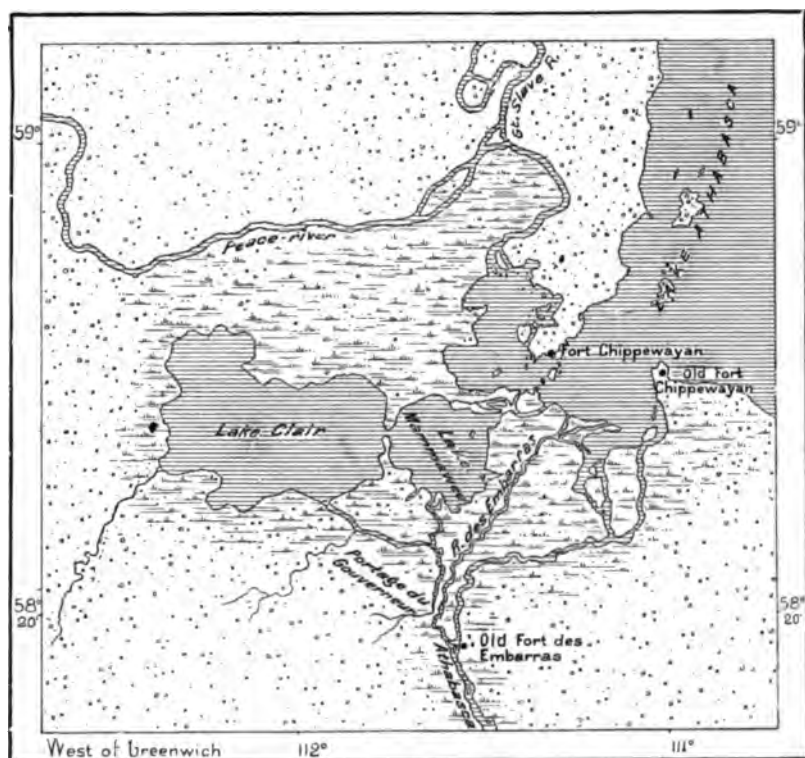
The lake, standing about 500 feet above sea-level, takes the form of a crescent with its convex side facing northwards. But its shores are very irregular and deeply indented by inlets, and like other lakes of this region, it occupies a depression in the granite rocks, which here form steep but low banks. A few rounded hills of Laurentian and Huronian formation, offshoots of the Caribou Mountains, appear only on the north side, so that Hearne was scarcely justified in naming this basin the "Lake of Hills." It is joined on the east by several considerable streams, mostly emissaries from smaller lacustrine basins. Hearne, however, was wrong in connecting with this hydrographic system the Wollaston and Deer Lakes, which drain through the Churchill to Hudson Bay.

At its western extremity the lake receives its great tributary, and here also lies its outlet, so that the deltaic region is common both to affluent and effluent. But owing to the gradual desiccation of the land, the streams have a tendency to be deflected eastwards. The main branch of the effluent, which here takes the name of the Great Slave River, also winds between low-lying plains alternately dry and flooded. But it is rapidly increased in volume after receiving the various channels through which the Peace River ramifies at its mouth. The Peace rises in British Columbia, on the elevated plains formerly occupied by a vast lacustrine basin,

while its chief branch, the Panais or Parsnip River, takes its origin north of the great bend of the Fraser, the two streams being connected, according to Petitot, by a portage scarcely more than 300 yards long. After escaping from its upper valley, the Parsnip is joined by the Finlay, the united stream taking the name of Unshagah, or "Peace,"* and forcing its way through a romantic gorge in the Rocky Mountains down to the plains. After rushing over a limestone ledge 8 or 10 feet high, it enters the Athabaskan depression through a fertile region abounding in grassy prairies, magnificent forests, and herbaceous slopes.

Fig. 79.—SWAMPY DELTA OF THE ATHABASCA.

Scale 1 : 1,200,000.



Being formed by the united waters of the Athabasca and Peace rivers, the Great Slave is a very copious stream; but at its passage through the Caribou hills its course is obstructed by long rapids, so that the boatmen have to cross seven portages successively between the confluences of the Dog River from the east and of the Salt from the west. Below these granitic barriers, begins under another name the true Mackenzie, the Des Nedhé, or "Great River," of the natives, which is henceforth perfectly navigable for about 1,450 miles to its estuary in the Arctic Ocean. It flows at first between wooded alluvial banks, beyond

* Daniel Gordon, *Mountain and Prairie*.

which it ramifies through several branches in a now dried up lacustrine region to its mouth in the Great Slave Lake, so named from the Indians occupying its western shores.

This inland sea, one of the largest in North America, fills a depression running south-west and north-east parallel with the series of rocky ridges traversing the North-West Territory from one extremity to the other. It is no less than 300 miles long, with a varying breadth 60 miles at the widest points, and a total area roughly estimated at 10,000 square miles, or some fifty times that of Lake Geneva. The western section is shallow, being half filled up by the sedimentary matter deposited by the Great Slave, Hay, and other affluents. But the eastern section, encircled by steep cliffs or banks, is said to have a depth of over 650 feet. Here also the shores are more indented by long narrow inlets, the two easternmost of which are separated by a sharp peninsula, terminating in a headland of black serpentine, called the "Rock of the Pipes," because it supplies the material with which the Yellow Knife Indians make their calumets.

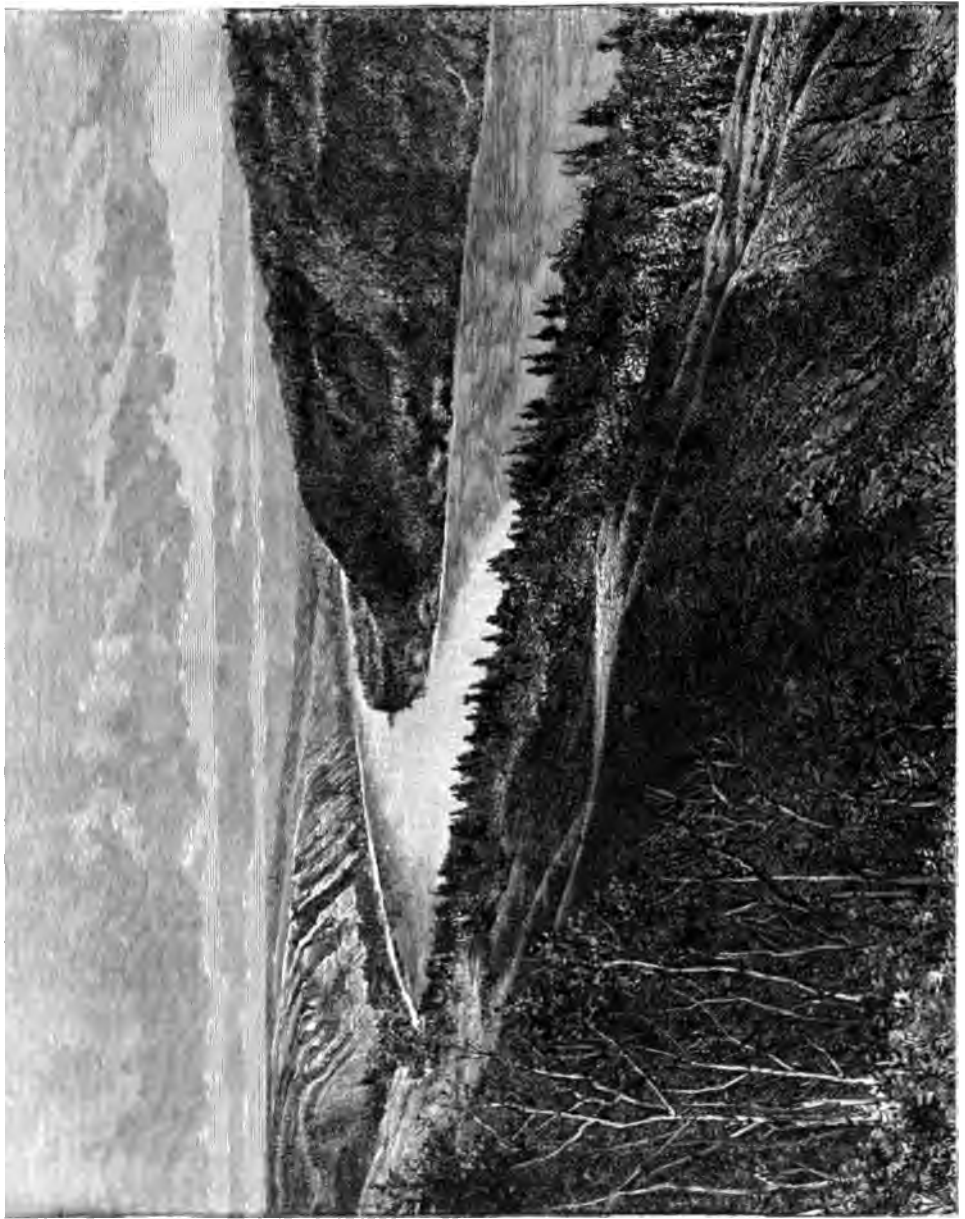
Each of the inlets of the Great Slave Lake has its affluents, themselves emissaries from other lakes. Thus the long northern gulf receives the overflow from Pike, Marten, and Grandin Lakes; Christie Bay in the south-east some smaller tributaries, and MacLeod Bay in the north-east the discharge from Aylmer, Clinton-Colden, Artillery, and other basins, all draining through the "Queue de l'Eau." Some 12 miles above its mouth, this affluent tumbles over the Parry Falls, said by Back to be 400 to 500 feet high, and so contracted that one fancies one might take it at a bound. Vapours rise in clouds hundreds of yards above the chasm; but during the eight winter months, the chief beauty of the cascade is due to the pendant icicles fringing the overhanging ledges, and protruding from the cavities of the rocky walls. An endless variety of tints is imparted to the scene by the green mosses and ruddy ferruginous cliffs, producing an effect to which even that of Niagara cannot be compared. On the Hay River, another affluent of the lake, other cascades occur, which have also been described by enthusiastic explorers as "finer than Niagara."

The Great Slave Lake, whose northern waters are crossed by the sixty-third parallel, forms with the tributary basins a parting line between two climates. On emerging from the lake through its north-west outlet the Mackenzie enters its Arctic valley, where it expands at first into almost stagnant basins, then contracts its banks and falls rapidly down to its confluence with the Liards, a large tributary from the south. Like the Peace, the Liards or "Poplars," rises on the west slope of the Rocky Mountains, and after collecting the overflow of the Dease and other lakes, escapes through a very precipitous breach in the mountains. Below the confluence the mainstream almost everywhere maintains a width of at least 2,000 yards; but at many points, especially above the mountain gorges, its banks recede as much as 4 or 5 miles, while the lateral terraces, standing at various elevations up to 350 feet above the present stream, attest the enormous volume of water discharged through this fluvial bed at a former geological epoch. Several rapids, of which the Sans-Saut alone offers any dangers to the navigation, follow along this part

of its course down to the neighbourhood of the Fork Lake, where the river ramifies through the branches of its delta.

The Great Bear Lake, like the two other large lacustrine basins belonging to the Athabasca-Mackenzie hydrographic system, lies to the east of the Mackenzie,

Fig. 80.—PEACE RIVER—VIEW TAKEN AT FORT DUNVEGAN.



from which it is separated by an isthmus some 60 miles broad. Although not so long, the Great Bear is much wider than the Great Slave Lake, and also appears to cover a greater area and to contain a larger volume, judging at least from the soundings of Franklin, who failed to touch the bottom with a 45-fathom plummet.

The basin consists of five bays with intervening rocky promontories from 650 to 800 feet high, beyond which stretch the north-eastern solitudes, snowy wastes swept by the Arctic winds and covered with a snow-cap for the greater part of the year; in 1838 the lake itself was ice-bound for ten months. All the bays receive affluents except the north-western, which is separated by a portage only a few hundred yards wide from the Hare-skin River, now flowing to the Lower Mackenzie, but at one time apparently a tributary of the lake. On the other hand the Lake of the Woods on the north side probably sends its overflow through an underground channel to the Great Bear Lake.

According to Petitot's map, the vast delta of the Mackenzie extends north and south a distance of 90 miles with an area of 4,000 square miles, and is still rapidly encroaching on the sea. This delta, however, is common also to the Peel or Plumée, which joins it from the west, and whose mouth has been mistaken by Franklin and other navigators for a branch of the Mackenzie. After issuing from the Rocky Mountains the Peel winds between this range and a lateral limestone ridge through a desolate level plain, whence its Canadian name of Plumée (*Déplumée*), that is, "treeless," "waste," or "arid." According to MacIsbiter, a forked channel sends its two navigable branches, one to the Peel, the other to the Rat, an affluent of the Yukon.

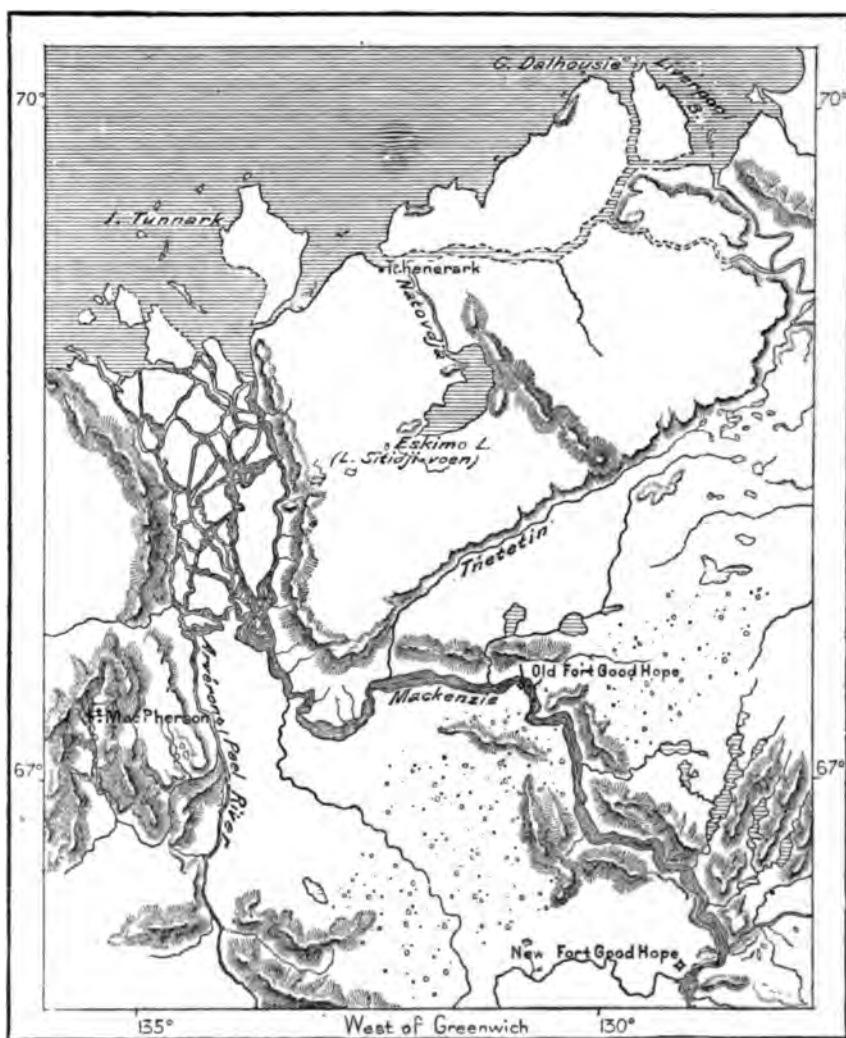
Since 1887 the Athabasca-Mackenzie, which has a total length of nearly 2,700 miles and a catchment basin of at least 460,000 square miles, has been regularly utilized for the transport of provisions and merchandise. Steamers starting from Lake Winnipeg ascend the Saskatchewan to a large rapid, which is turned by a short railway, beyond which the navigation is renewed. Then a carriage road 100 miles long runs to the Athabasca, which is descended by alternate steamers and flat-bottomed boats to Fort Smith on the Great Slave River. Here occurs another portage of 12 miles, beyond which steamers drawing 5 feet ply regularly on the Mackenzie to its estuary as well as on the Peace and Liards rivers and on Lake Dease. Thus is presented on the united Saskatchewan and Athabasca-Mackenzie basins an almost completely navigable waterway of about 7,500 miles, beyond which the navigation might be continued along the Arctic seaboard to Bering Strait at least for three months in the year.

The Anderson, MacFarlane, and other streams flowing east of the Mackenzie in parallel courses to the Frozen Ocean are of comparatively small size, and traverse a dreary solitude, where the rocky cavities are flooded with innumerable little lakes, which send their overflow either through surface channels or underground passages seawards. The Coppermine, so named from the native copper collected on its banks, is, however, a very large river with a course estimated at 360 miles, while its valley forms the northern continuation of the Yellow Knife, a tributary of the Great Slave Lake. Being long known to the Indians and trappers for its mineral wealth, the Coppermine was selected as the object of the first scientific expedition sent to the north-west under Samuel Hearne in 1770. In the lower part of its course it is completely obstructed by numerous falls and rapids, the last of which has been named Bloody Fall in memory of the Eskimo here massacred

by the Indians. It lies 10 or 12 miles above Coronation Gulf, a broad basin separating the insular masses of Wallaston, Prince Albert, and Victoria Lands from the continent. A slight upheaval of the ground would convert this gulf into an inland sea like the Athabasca, Great Slave and Bear lakes, which would

Fig. 81.—THE MACKENZIE DELTA.

Scale 1 : 3,700,000.



themselves be transformed to marine inlets by the opposite movement of subsidence.

Next to the Mackenzie the largest stream flowing to the Arctic Ocean is the Great Fish River, called also the Back from the daring explorer who descended its course in 1834. Its Indian name, Luetchor, that is, "Great Fish," has reference

to the numerous whales frequenting the waters in the neighbourhood of its estuary. It rises in a lakelet so close to Lake Aylmer of the Athabasca-Mackenzie system, that it has often wrongly been described as connected with that basin. Throughout its whole course, estimated by Back at 600 miles, it flows through a dreary inhospitable waste of rocks and barren plains, whose monotony is unrelieved by a single tree. In its middle course it floods several large depressions, and is here obstructed by numerous rapids, of which Back reckoned as many as eighty-three.

At its mouth, which is also barred by sand-banks, the Great Fish expands into a broad estuary, opening upon a marine inlet which resembles Coronation Gulf with its complexities of bays, straits, and fjords, and which, like it, would be transformed to a lake by a slight upheaval of the land. On the other hand, a subsidence of a few yards would change to islands the large Boothia and Melville Peninsulas.

The natural limit of the North-West Territory in this direction is the Rae Isthmus, marked by a double chain of lakes and meres between the Arctic Ocean and the northern straits of Hudson Bay. This angular limit of the continent is traced along a general line running south-east and north-west, and coinciding with the seaboard between Newfoundland and Boothia Felix.

CLIMATE OF THE NORTH-WEST TERRITORY.

In its oscillations south of the true North Pole, the meteorological pole usually passes above the northern lands, which for seven or eight months remain covered with snow, while the subsoil is permanently frozen beneath a thin layer of humus, which thaws sufficiently for a few Arctic plants to strike their rootlets into the ground. The whole of the Mackenzie delta, as well as the lower course of the Coppermine and Back rivers, belongs to this polar zone, where for a long night of two months the sun never rises above the horizon. The glass has occasionally fallen to -62° Fahr. at the New Fort Good Hope in $66^{\circ} 20'$ north latitude, and for six months, from October 17th to April 24th, the average temperature has been -14° Fahr. at Fort Confidence in $66^{\circ} 54'$ latitude. At these low temperatures the human breath rises in the air as dense white vapour, whose sudden condensation into extremely minute icicles is accompanied by a slight crackling noise.*

Snow seldom falls during intensely cold weather, and Petitot never observed it when the glass stood lower than 18° Fahr. The numerous kinds of snow, for which the natives have a surprising variety of terms, are produced under special conditions of the temperature, winds and vapours; usually it is formed very near the surface of the earth in the lower stratum of fogs, while higher up the sky is

* Meteorological records in the North-West Territory :—

	Latitude.	Mean Temperature.	Extremes of Cold.	Extremes of Heat.
Fort Dunvegan . . .	$55^{\circ} 56'$	31° Fahr.	-60° Fahr.	90° Fahr.
Fort Chippewayan . . .	$58^{\circ} 43'$	27°	-49°	86°
Fort Rae . . .	$62^{\circ} 39'$	22°	-40°	78°
Fort Good Hope . . .	$66^{\circ} 20'$	—	-62°	—

perfectly clear with bright sun and stars. The Hare-skin Indians divide the year into sixteen parts, each specially named with reference to the snows or frosts, the winter darkness and the brightness of summer. But they scrupulously avoid uttering the name of the sun, which must be respectfully referred to by some complimentary periphrase.

During the short summer the heats often appear intolerable even to the natives, who sleep away a considerable part of this period, while much of the long winter night is devoted to the chase, travelling, and fur-dressing. When the sun remains forty-eight hours above the horizon the temperature scarcely changes from midday to midnight. Abrupt changes coincide with the shifting of the winds, the cold currents coming from the east, north-east, and even south-east, the relatively mild from the north and north-west. The latter, flowing from large marine surfaces, often assume the character of fierce gales; prevailing especially in January, and at times tepid enough to cause a momentary thaw.

In the southern part of the basin, notably in the Peace Valley where the mean temperature lies near the freezing point, the west winds have a like influence, rendering these regions habitable and even capable of supporting a considerable population. The so-called "Chinook Winds," setting from the Pacific Ocean and sweeping across the Columbian Plateau and Rocky Mountains, resemble the east winds of Greenland, the Swiss föhn and the "autan" of the Pyrenees, all developing a degree of heat through the condensation of the air after crossing the mountains. Thanks to the deflection of the isothermals north-westwards under the influence of these Pacific currents, the valleys of the Athabasca and Peace rivers are scarcely colder than that of the Lower St. Lawrence, while the summer heat suffices to ripen cereals. Here the chief dangers are the early and late frosts, which have been observed on the banks of the Peace River even in the month of August. On the other hand these regions are greatly favoured by the long duration of the solar heat, the sun remaining above the horizon at midsummer for over seventeen hours under 56° north latitude, that is, about the middle course of the Peace. Anemones flourish in this valley earlier than on the banks of the Ottawa 730 miles nearer the equator.

FLORA AND FAUNA.

The Athabasca-Mackenzie basin is naturally divided into two distinct botanical regions, the forest zone of the south and south-west, the treeless of the north and north-east. In the former the prevailing tree is the white pine, with which are associated other conifers, spruces, firs, cedars and larches, which, however, scarcely reach so far north as 62° . The aspen and balsam are also common, their range extending even to 68° , and from them several rivers take their name. The white birch abounds in the forest districts, but is seldom allowed to reach maturity, the Indians felling all well-grown stems for their boats. Lastly the dwarf birch, alder and willow advance northwards to the region of mosses and trailing plants. Petitot even speaks of "gigantic" willows, apparently a distinct

species, on the banks of the Peel River. On the shores of the Great Bear Lake vegetation develops so slowly that pines four hundred years old have a girth scarcely exceeding 8 or 10 inches. Berries of all kinds abound in the forest region; formerly the Indians of the Saskatchewan migrated every summer to the Peace Valley, 250 miles from their camping grounds, in quest of these fruits,* and owing to the failure of the crop hundreds of natives perished in 1889.

In many of the forest districts prairies alternate with the woodlands, the disappearance of the timber being probably due partly to deficient moisture, but perhaps mainly to conflagrations. Where no fires break out for a number of years, trees begin to spring up again, the second growth consisting chiefly of the aspen, here and there of the birch; but these soon perish and are replaced by the white pine, the characteristic tree of the north-western forest zone.

The treeless boreal region, the "barren grounds" of English writers, occupy a vast space especially in the eastern parts bordering on Hudson Bay. The Great Fish River basin is entirely comprised within this zone. From the verge of the forests south of Chesterfield Inlet to the Frozen Ocean along the shores of Melville Peninsula or Boothia Felix the traveller may roam for over 600 miles across plains and plateaux covered with nothing but lichens, mosses and short herbage. Nevertheless, these boundless wastes also yield the blackberry, the wild raspberry, whortleberry, gooseberry, strawberry, saskatoon pambina (*viburnum edule*), supplying nutriment to the bear and even to man himself. In many places these "barren grounds" also yield abundant pasture to herbivorous animals, the reindeer lichen, commonly called the "bread of the caribou," covering vast tracts. Even the rocks are clothed with an almost edible vegetation, such as the *gyrophora proboscidea*, which despite its disagreeable flavour has saved the life of many a traveller and fur-hunter.

The parting line between the forest and steppe zones coincides also with that of two distinct zoological regions. Many animals keep exclusively to the woodlands and clearings, while others roam the boundless mossy plains. In the southern zone still survive a few herds of the forest bison, which scarcely differs from the prairie species. Here also are met the wapiti, the *alce americanus* and the caribou (*rangifer caribou*), a species of deer also common on the northern plains. The beaver, like most other fur-bearing animals, whether carnivorous or herbivorous, is confined to the woodlands, where the rabbit and its enemy, the lynx, increase and diminish in numbers by periods of seven to nine years. After multiplying prodigiously, they are swept away by some contagious disease, the few survivors preserving the stock, which in a few years again teems as before.

In the northern steppes the mammals are represented by a species of caribou (*rangifer groenlandicus*), the berry-eating brown bear, the musk ox, wolf, fox, Arctic hare, and other fur-bearing animals, most of which, however, migrate southwards in winter. Aquatic birds, which are very numerous, also shift their

* Butler, *The Great Lone Land*.

quarters with the seasons, and even marine fishes ascend a long way up the estuaries. M. Macoun enumerates 32 species inhabiting the Mackenzie, including salmon, perch, and whitefish (*coregonus albus*), most esteemed of all. Travellers also frequently mention the "unknown" or "edentate" fish, which despite its Latin name, *salmo Mackenzii*, is not a salmon, but rather a species of mullet, which ascends as far as the Great Slave Lake, and is also found in the Yukon.

Snakes scarcely range beyond 56° north latitude, although some are found as far north as the Upper Yukon basin, while a solitary batrachian, a species of frog, is met in the upper valley of the Peel River. In the marine inlets English navigators have observed whales disporting themselves under shelter of the floe ice.

INHABITANTS.

Despite their scanty numbers, the inhabitants of the North-West Territory belong to three distinct families, the Eskimo, Tinnah and Algonquin.

The Eskimo are akin to the Innuits of Greenland, the Arctic Archipelago and Alaska, and in the Mackenzie district call themselves Tchiglit, a term synonymous with Inuit, that is, "Men." They number about 2,000, scattered along the seaboard between the Colville and Coppermine Rivers, and also penetrate up the estuaries some distance inland. In the Mackenzie Valley they even range beyond the estuary proper as far as the first gorges and rapids, their real limit being that of the tundras, while the forest zone belongs to the Red-skins. Being still pagans they despise their half-civilised Indian neighbours, and local traditions, as well as the direct evidence of the whites, speak of great battles between the two races.

The Eskimo of the Peel River are tonsured like European monks, "in order," as they explain, "that the sun, our common father, may warm our brain and send down to the heart its beneficent heat." But in other respects the usages of the continental Tchiglits differ in no way from those of the insular Eskimo, and like them they are diminishing in numbers. Certain circular stone enclosures towards the estuary of the Great Fish River seem to attest a former higher state of civilisation, for the present local tribes, Nechiliks and Kideliks, would be quite incapable of erecting such fortified lines. North of the Great Slave Lake are also found some pyramidal structures, which appear to have been altars.

The Tinnahs, a term also meaning "Men," are designated by many writers under the name of Athabascans from the lake and river Athabasca, and also Chippewayans, or "Pointed Skins," from the form of their cloaks. Petitot calls them Déné-Dinjié, which is simply a repetition of their own name under two different dialectic forms.* They comprise a great number of tribes, the most important of which are the Athabascans proper, who roam the plains between the

* Other tribal variations of Tinnah are: *Dené, Diné, Dané, Dnainé, Tin, Gotiné, Kochin, Kotsin, Dinji, Dinja, &c.*

Churchill River and the Great Slave Lake. Near this lake, and especially about its northern shores, also dwell the Dog-ribs, so named from the national legend of their canine descent. According to Petitot these Indians all stammer. At a recent epoch they were to a great extent exterminated by the Slave tribe, which occupies the western shores of the lake. Gentle, timid, and long-suffering, these "Slaves" had well earned the contemptuous name bestowed on them; but they were at last driven to turn on their oppressors. In the Mackenzie Valley the language of barter is the Slave jargon, a mixture of Slave, Kree, and French-Canadian elements.

Many of the Chippewayans are distinguished by their natural intelligence, and King mentions a skilful musician who constructed an excellent fiddle, which he played with much taste.* They usually dress in the European fashion, and build themselves comfortable little houses; nor do they any longer pierce the lips and cartilage of the nose for the insertion of buttons, bones, or shells.

On the slopes of the Rocky Mountains are met the Beavers, the Carriers, the Babines, the Naanneh, or "People of the West," and others connected on one hand with the Slaves, on the other with the Tinnehs of British Columbia and with the Tanana Indians of the Yukon and its waterpartings. The Hare-skins, so-named from their costume, are an inoffensive nation scattered in small groups over the steppes bordering on the Eskimo domain. Lastly the Lower Mackenzie and the region stretching thence westwards into Alaska belong to the Loucheux, who were so called by the early Canadian trappers on account of their sinister oblique glance. Mackenzie also gave them the uncomplimentary name of "Quarrellers," from their wranglings with the Eskimo, of which he had been witness. But Franklin explains the term Loucheux in the sense of "cautious" or "wary" in reference to their skill in looking both ways at once, to avoid the arrows of the enemy. According to Petitot they are ten times more numerous in Alaska than in the Mackenzie basin; but it is chiefly on the banks of this river that they come in contact with Europeans for the sale of their peltries. They practise circumcision, and some of their Eskimo neighbours have adopted the same rite, which is very rare amongst Indian tribes, though said by Mackenzie to be also general amongst the Dog-ribs. But despite this practice the Loucheux, as well as all the other Tinneh, except a few remote groups in the Rocky Mountains, have become fervent Roman Catholics.

The third ethnical family in the Athabasca-Mackenzie basin are the Eyinisuks, or "Men," the "Cris des Bois" of the Canadian trappers, whence the Cree, or Kree, of English writers. They are a gentle, upright people, now reduced to about a thousand, all Catholics, like their Tinneh neighbours. The true domain of the Kree nation is the Upper Saskatchewan basin, whence they gradually spread beyond the portages northwards. Of all the Indians of the North-West they are most threatened by the rising tide of white immigration; some hundreds of whites and Chinese have already settled on the Upper Athabasca and on the Peace River in the Omineca and Cassiar terri-

* Richard King, *Journey to the Shores of the Arctic Ocean*.

tory, and these are regarded by all Canadians as the pioneers of many

Fig. 82.—INDIAN TRAPPERS OF THE UPPER TANANA.



millions destined to transform those vast solitudes into flourishing settlements.

ADMINISTRATION—THE HUDSON BAY COMPANY—MINERAL WEALTH.

Till recently the Hudson Bay Company had systematically reported that the climate was too severe, and the soil too unproductive for Europeans to establish themselves in the northern regions; nevertheless there can be no doubt that the valleys of the Peace and Great Slave Rivers as well as many other tracts in those high latitudes, might be profitably cultivated; for wheat thrives as far as Fort Liard near the sixtieth parallel.* The Athabasca delta especially gives promise of magnificent crops, as attested by the samples shown at various agricultural exhibitions. At Fort Simpson in 62° north latitude a boat is every year loaded with potatoes to supply the station of Good Hope on the Lower Mackenzie. Here also barley is in ear 75 days after being sown, although within 10 or 12 feet of the surface the ground is permanently frozen for a depth of at least 7 feet. But on the other hand snow is seldom more than 3 feet deep in winter, and horses may pass this season in the open. Another advantage is the absence of locusts; but no serious attempt will be made to occupy this region so long as so much rich land still remains fallow in Manitoba and in the provinces traversed by the Canadian trunk line.

The vast North-West Territory has hitherto practically belonged to a trading monopoly. In 1821 the two rival Hudson Bay and North-West Companies closed a long period of hostilities by merging in a single commercial association, with the result that the monopoly became absolute. This lasted till 1859, and even when legally abolished, the system maintained itself by the very nature of things. In 1869, after a profitable liquidation and reorganisation of the Company, it surrendered all its privileges to Canada for an indemnity of about £300,000, a grant of 7,000,000 acres in the most fertile part of the territory, the possession of all the trading stations, and a space of 60 acres round the enclosures. The Company ceded its dominion, but the colonists succeeded only to the southern part of its former domain. In the Athabasca-Mackenzie basin, the official survey of which has not even yet been commenced, the commercial supremacy of the Hudson Bay Company has not even been threatened.

Thus the whole trade of the north is still in the hands of this all-powerful association. Although all restrictions have been removed, the theoretical right of freely trading with the Athabasca-Mackenzie Indians has hitherto tempted no outside speculators, who could scarcely hope to compete successfully with an association of capitalists who have for generations controlled all the trappers throughout a region six times the size of France. Great changes in the political situation were even required to deprive the Hudson Bay Company of its commercial monopoly in Alaska and the American states on the Pacific south of British Columbia.

The official suppression of the monopoly in British territory has in no way disturbed the trading relations in these northern regions, and the natives themselves may possibly have remained ignorant of the changed condition of things.

* J. Richardson, *op. cit.*

On the other hand, the Company totally disregards the administrative divisions, and continues to divide its territory into districts not according to degrees of latitude and longitude, but according to the abundance and quality of the game. Each district has its "capital," that is, a factory or trading post, comprising a group of three or four wooden structures enclosed by a square palisade 15 to 20 feet high. Most of these "forts" being military only in name, the palisades remain unfortified except where some precautions are needed by the attitude of the natives. In 1875, the servants of the Company numbered about a thousand, mainly English, Scotch, Anglo-Saxon, and French Canadians, and Franco-Canadian half-breeds, these last being still the dominant element.

The half-caste trappers in the Company's service have few equals in the world for physical strength, skill, endurance of cold and hardships, and coolness in the presence of danger. In the woodlands they have to discover the tracks by the scent of bear or caribou, or by the slight indications of their forerunners. From beneath the snow they have to disclose the lichens required to attract the musk ox. They thread their way unerringly across a labyrinth of dunes and rocks. Amid the endless intricacies of the lakes they detect the emissaries by the faintest landmarks. During the long winter nights, when dogged by wolves or bears, they guide themselves by the position of the stars. When they are associated together in small groups, they can lend each other mutual aid; but at times they find themselves cut off from all help, and then their life becomes a continuous struggle with death. A wrong turn in the forest, a breakdown in crossing a portage, a false stroke of the oar in shooting a rapid, loss of supplies or failure to bring down the game, the slightest mischance in these boundless solitudes suffices to involve them in imminent peril. Against famine especially every precaution has to be taken, and no expedition goes unprovided with the indispensable pemmican, which in like bulk contains almost more nutritious elements than any similar preparation. So satisfying is it that even the most voracious Indian can consume no more than five pounds in the twenty-four hours, the normal ration being half that quantity.*

In the districts where no white settlements exist, the price of merchandise, blankets, and other woven goods, tobacco, ammunition, pemmican, and the like is always valued in peltries, this "currency" itself having an ideal value. Formerly it consisted of real beaver-skins, but each article having its tariff fixed at a given number of "beavers," the exchange is effected without this symbol itself, which in some districts cannot be procured, and which is at present valued at about two shillings sterling. With the changes of fashion and the greater or less abundance of game, the peltries themselves rise or fall in price. Thus ermine being no longer in demand, this animal has ceased to be hunted, thus escaping the total extermination by which it was at one time threatened. The beaver also has had a period of respite since its fur has ceased to be used in the manufacture of hats. In the same way, the black fox has fallen in price owing to the discovery of the secret by which other peltries may be dyed a glossy durable black. The use

* Butler, *The Great Lone Land*.

of strychnine to take wolves and foxes has indirectly caused the wholesale destruction of many other fur-bearing animals, amongst which are the glutton (*gulo luscus*), respected for its almost human intelligence, and the skunk, dreaded less for its pungent odour than its bite, which causes a kind of rabies, different from but no less dangerous than that of the dog or wolf.

Notwithstanding the importance of the fur trade, future settlers will probably be attracted to the North-West Territory by its mineral resources. The valleys of the Liards and its affluents, and especially the basin in which is situated Lake Dease, appear to contain gold in abundance. Here are the famous Cassiar mines, so named from the Kaska Indians of the surrounding uplands, and the village of Laketon on the delta of Dease Creek was formerly the centre of a busy floating population. As indicated by its name, the Coppermine Valley is rich in copper deposits, and the old writers tell us that the few aborigines of this region used the native metal without smelting, but simply hammering it with stones.* Salt beds have been found both north and south of Lake Athabasca, where also occur stores of gypsum, lignite and kaolin, while, according to the latest reports of the geologists, the reservoirs of mineral oil would appear to surpass all those hitherto discovered in the New World. Indications of its presence have been observed everywhere from the Saskatchewan basin to Cape Bathurst, a total distance of 1,400 miles north and south. In the opinion of the Canadians, these petroleum-fields should already be regarded as a chief future resource of the Dominion. The Government accordingly proposes to reserve a space of about 40,000 square miles between the Lesser Slave and Athabasca Lakes for future concessions to capitalists capable of working these treasures. Soundings recently made in the same regions have also revealed the existence of vast supplies of inflammable gases.

TOPOGRAPHY.

In the absence of towns in the ordinary sense, the trading stations scattered over the North-West Territory possess vital importance as necessary rallying-points for all travellers, and as positions chosen on account of their natural advantages for carrying on the barter trade between the hunters and the agents of the Hudson Bay Company. Should future cities ever spring up in these vast solitudes, they will inevitably occupy such favoured sites, just as Quebec, Montreal, Toronto, Niagara, Winnipeg have grouped themselves round the forts erected by the early Canadian explorers. Some of the Athabasca-Mackenzie forts have already acquired a certain celebrity in connection with the names of Mackenzie, Franklin, Back, Richardson, and other renowned explorers.

One of the most important of these forts is *Jasper House*, standing at an altitude of over 3,300 feet, at the confluence of the Miette and Upper Athabasca opposite the Yellow-Head Pass, which leads westwards to the Fraser valley. But the largest place in the whole of the North-West Territory is the village and mission of *Lake La Biche*, which has a mixed population of 600 Krees and French half-

* Dobbs, *Account of Hudson's Bay*.

breeds. It commands the portages connecting the Upper Athabasca, the northern fork of the Saskatchewan and the Churchill, not far from *Athabasca Landing*, which has lately become the most frequented port and the head of the navigation in the Athabasca-Mackenzie basin. *Fort MacMurray* commands the confluence of the Athabasca and Clearwater at the famous *La Loche* portage, which for a hundred years was the main route of Canadian travellers and trappers.

At the western extremity of Lake Athabasca, *Fort Chippewyan* has several times shifted with the shiftings of the alluvial delta, and now stands opposite the mouth of the affluent and near the head of the outlet, not far from a mission and an orphanage which in 1888 contained 67 inmates, quite a large population for

Fig. 83.—POSTS OF THE HUDSON BAY COMPANY.

Scale 1 : 50,000,000.



those almost uninhabited regions. *Fort Fond du Lac*, at the eastern extremity of Lake Athabasca, is the most advanced station towards the regions which drain to Hudson Bay. In the Peace basin the chief station is *Fort Duntegan*, near the British Columbia frontier.

Fort Smith, the much-frequented port at the portage of the rapids between the Athabasca and the Mackenzie on the Great Slave River, is followed northwards by *Forts Resolution* and *Providence* on the Great Slave Lake. These places have become famous in connection with Franklin's expedition, just as *Fort Reliance* is associated with that of Back. But the latter, founded only for the purpose of furthering the exploration of the Great Fish River, has now been abandoned, while *Fort Rae*, on the northern inlet of the Great Slave Lake, has been restored, at

the joint charge of the British and Canadian treasuries, as the central meteorological station in the North-West Territory.

In the region comprised between the Great Slave and Great Bear lakes, the chief station is *Fort Simpson*, at the confluence of the Liards and Mackenzie rivers, where it commands the route from the sources of the Stickeen to South Alaska. The new *Fort Good Hope*, which replaces an old post swept away by the floods of the Mackenzie in 1836, occupies a position analogous to that of *Fort Norman*, at the junction of the Mackenzie and Hare-skin rivers. On the other hand, *Fort Macpherson*, on the Peel River, has been maintained in a state of defence since 1848, in order to command the Eskimo and Loucheux territories, which are conterminous about the Mackenzie delta.

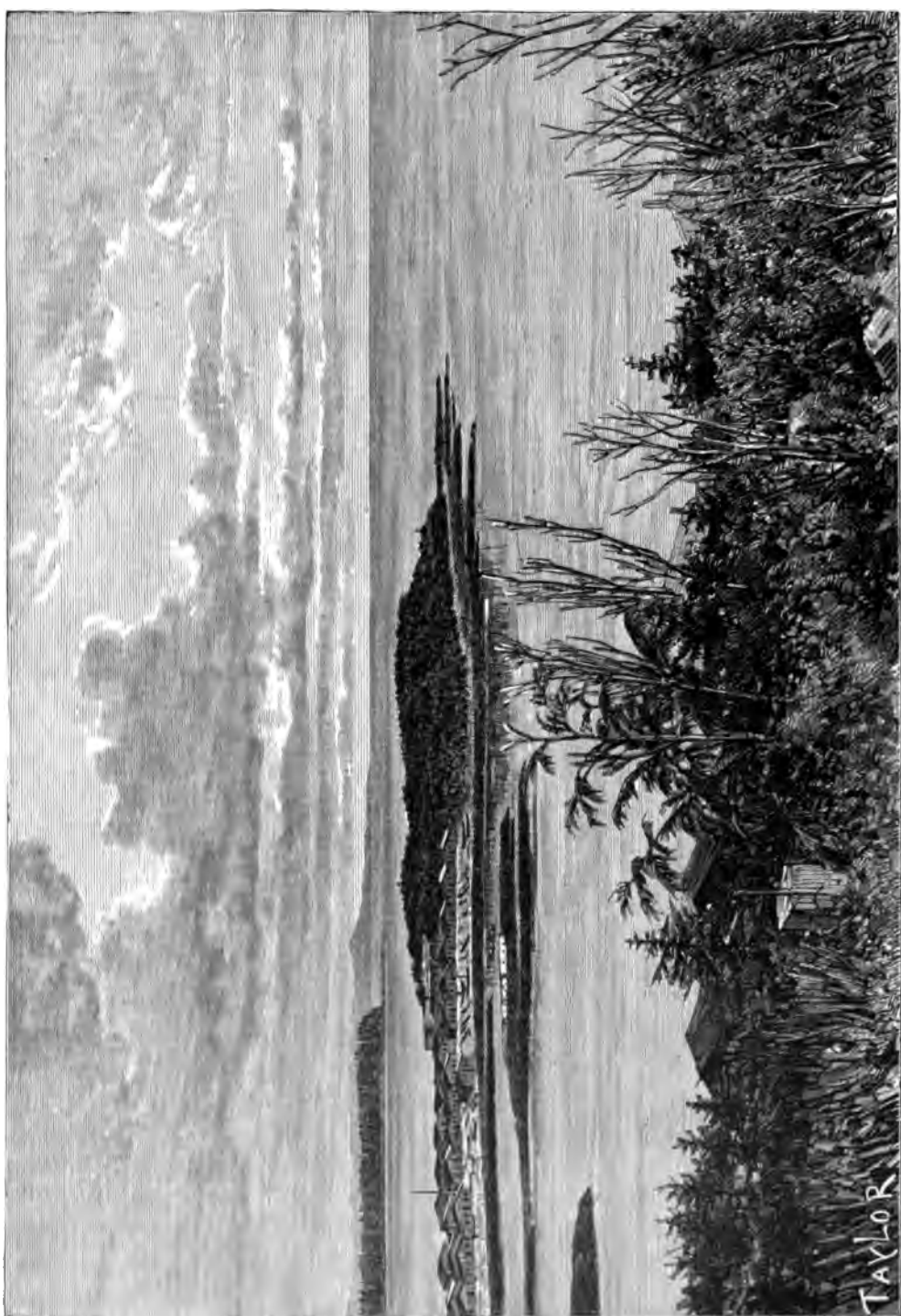
In the vast "barren grounds" stretching from the Mackenzie eastwards, the only factory maintained by the Hudson Bay Company is *Fort Enterprise*, which occupies a central position in the triangular space formed by the Great Slave Lake, Great Bear Lake and Coronation Gulf. *Fort Confidence*, which had been erected on the north-east gulf of Great Bear Lake, has been abandoned.

IV.—LAKE WINNIPEG BASIN AND REGION DRAINING TO HUDSON BAY.

ALBERTA—SASKATCHEWAN—ASSINIBOIA—MANITOBA—KEEWATIN.

A large section of this territory, forming a portion of the former Ruperts' Land or domain of the Hudson Bay Company, has already been divided into administrative provinces, which, however, follow geometrical lines rather than natural frontiers. The four territories, cut into so many rectangles draining to Hudson Bay, are the Province of MANITOBA, and the Districts of ALBERTA, SASKATCHEWAN and ASSINIBOIA, which, with the whole of the Athabasca-Mackenzie basin, comprised the so-called "North-West Territory." Towards the east and north-east the region sweeping round the west side of Hudson Bay still remains open, either to be eventually divided into new provinces, or else assigned to one or other of the already constituted states of the Dominion. This undefined space, which merges imperceptibly northwards in the unexplored tundras between Hudson Bay and the Great Fish River, has been provisionally designated by the name of KEEWATIN, or "North Wind," a name fully justified by the rude climate of these bleak north-eastern wastes.

On the south the Winnipeg provinces are limited by the forty-ninth parallel, the conventional boundary between the Dominion and the United States. Had the true parting-line been adopted between the Winnipeg and Mississippi basins, the first landmark would have been placed in the Rocky Mountains of Montana between the headstreams of the St. Mary and Milk Rivers, respective tributaries of the Saskatchewan and Missouri. From this point the water-parting runs north-eastwards for about 440 miles through Canadian territory, and then turns



FORT SIMPSON, AT THE MACKENZIE AND LIARDS CONFLUENCE.

south-eastwards through North Dakota and Minnesota, so as to enclose the basins of the Red and Rainy Rivers, both affluents of Lake Winnipeg. Within the Canadian frontier the portage between this basin and that of Lake Superior lies a short distance to the west of the latter.

In the absence of complete trigonometric surveys, the vast Winnipeg region, as officially circumscribed, can only be roughly estimated at about 850,000 square miles, with a white and aboriginal population probably not exceeding 200,000 in 1889. But the stream of immigration has already been directed towards these provinces, where vast tracts of productive soil have been opened up by the Canadian Pacific and other railways. The Pacific line, especially, traversing the whole region from Lake Superior to the Rocky Mountains, has become the great artery whence life is distributed throughout the surrounding lands. It replaces the natural routes of the lakes, rivers, and portages, along which traffic formerly moved at a slow pace.

PHYSICAL FEATURES.

Within the Winnipeg basin the Rocky Mountains throw off no branches, properly so called, to the eastern plains. Here the rolling prairies dash like billows against the foot of a rocky headland, and the transition is everywhere abrupt between the escarpments and the steppe lands. The heights scattered over the region between the Rocky Mountains and Lake Winnipeg resemble the fragments of plateaux eaten away by erosive action, and nowhere rise to any great elevation above the surrounding steppe.

Taken altogether, the whole of this region may be considered as forming three terraces with parallel scarps following successively from the foot of the mountains to the Winnipeg depression, and standing at the respective altitudes of 3,300, 1,600 and 650 feet. The various eminences rising above the escarpments have the aspect of hills or ranges only when seen from the lower terraces. On the off side they merge in the plains themselves, or at least have merely the aspect of slight undulations.

The western terrace, stretching along the base of the Rocky Mountains, has an average breadth of about 450 miles, and falls abruptly in ravined cliffs down to the plains watered by the Mouse, the Qu'Appelle, and the Saskatchewan, about the converging point of its two forks. On this plateau, which slopes gently eastwards, the heights which present most the aspect of a range, especially when half veiled in the rising mists, are the Cypress Hills, whose highest crests have an absolute height of 4,000 feet, and about 1,000 above the surrounding saline lacustrine plains. These almost isolated hills form a waterparting between the Saskatchewan and Missouri basins. They are encompassed by fluvial channels, some dry, some still flooded, which radiate in every direction, and which are connected by no well-marked high grounds with the Three Buttes (6,900 feet), in the neighbouring state of Montana.

The Hand Hills, rising between the two great forks of the Saskatchewan north of the Pacific Railway, are also encircled by arid tracts, hard clays of the chalk epoch, where no shrub can strike root. Such, also, is the character of the other chalk

or sandstone eminences rising from a few hundred to perhaps a thousand feet above the mean level of the plateau. In some districts the prairie is likewise traversed by ranges of dunes, and even shifting sands.

Of all these rising grounds the most picturesque are the Wood Mountains, which lie within the Missouri basin, their northern extremity being surrounded by affluents of that river. They are intersected from east to west by the frontier-line between Canada and the United States, thanks to which they were till recently a

Fig. 84.—CYPRESS HILLS.

Scale 1 : 1,500,000.



place of refuge for Indians escaping from the Republic. Here the famous Dakota chief, Sitting Bull, pitched his camp in 1862, after overpowering and massacring a detachment of American troops. The upland valley and neighbouring prairies were also roamed by myriads of bisons, which supplied superabundant food for the Red skins. Now Indians and bisons alike have vanished.

The scarp of the western terrace is uniformly disposed south-east and north-west parallel with the main axis of the Rocky Mountains. It takes the Canadian name of Coteau du Missouri, Coteau des Prairies, or Grand Coteau, and runs almost uninterruptedly for about 650 miles from the Missouri to the Saskatche-

wan across the conventional frontier. The Grand Coteau presents the aspect, not of a single scarp or continuous slope, but of endless *buttes*, or knolls, and rounded promontories consisting of boulders and gravels, evidently ice-borne during the glacial period. The finer *débris*, such as clays and sands, were carried farther afield, and then distributed by the running waters over the lower terraces.

The Grand Coteau is interrupted only by a few gorges for the passage of rivers, which have developed meres, for the most part saline or brackish, along the face of the escarpments. The existence of ancient lakes is also attested by cavities now dried up, but filled with whitish efflorescences. On the plateau the chains of saline ponds and now empty lacustrine depressions mark the passage of old glacial streams, which have run dry during the present geological epoch. Altogether, it seems evident that the long rampart of the Coteau is simply the front of a vast moraine which was formerly carried from the Rocky Mountains down to the central depression of the continent. The blocks piled up along the frontal line belong to all ages from the Laurentian to recent times; but the sands, clays, and surface rocks of the plateau itself are of chalk and tertiary formation. They contain vast deposits of lignite, whence the expression "plateau of the tertiary lignite," sometimes applied collectively to the upper terrace. The remains of large extinct animals have been found in several places, and are venerated by the Indians as belonging to some potent spirit.

The intermediate terrace bounded on the west by the Grand Coteau is much narrower, scarcely exceeding 200 miles from scarp to scarp. Like the upper plateau, it presents isolated knolls, showing traces of erosion, and remaining as standing proofs of a former higher level reduced by denudation. The outer edge, broadly pierced by fluvial valleys, is far less regular than the Grand Coteau, being broken into separate masses, which present the appearance of mountains only on their eastern slope. Such are the Pembina Hills, west of the Red River of the North, the Riding Mountains, Duck Mountains, and Porcupine Hills, west of Lakes Manitoba and Winnipegosis. The groups scattered over the plateau also bear the names of animals—Turtle, Moose, Pheasant, Beaver Hills or "Mountains." Northwards the terrace itself falls abruptly down to the Saskatchewan valley.

Lastly, the eastern and lowest terrace skirts the valley of the Red River and the Winnipeg depression. These old alluvial tracts consist of a thick layer of humus containing in abundance the ashes of grasses yearly consumed by the prairie fires. The subsoil is also alluvial, but changed to a marly consistence by intermixture with the countless shells of freshwater mollusks. Few regions can compare with this for natural fertility. But a large part of the valley is occupied with marshy tracts, which it would be too costly to reclaim for tillage. They produce, however, an abundance of coarse grasses.

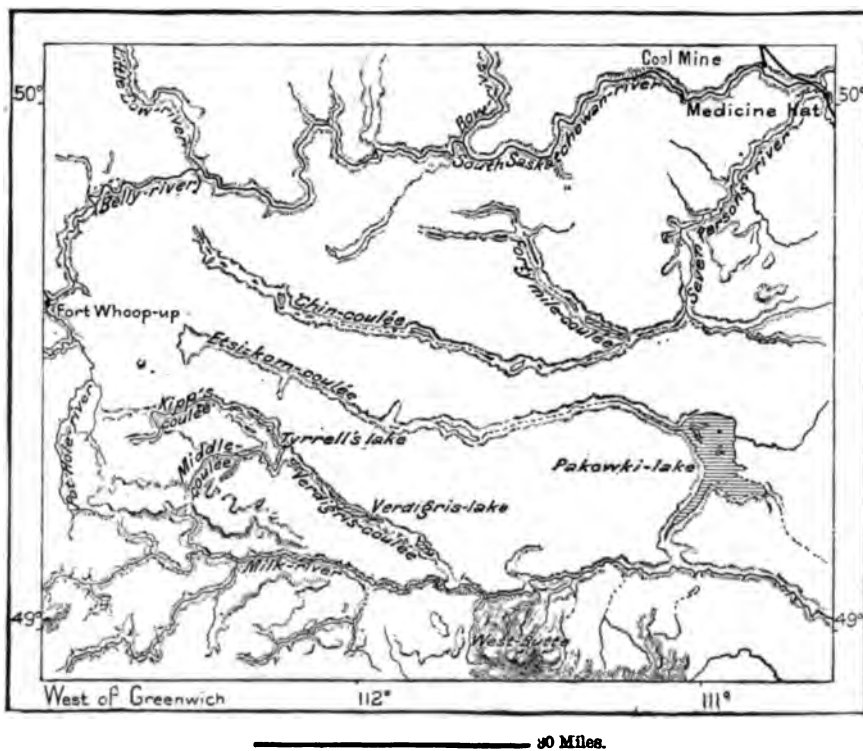
RIVERS AND LAKES.

The chief watercourse of this region is that known in its upper reaches between the Rocky Mountains and Lake Winnipeg as the Saskatchewan, properly

Kisiskatchiwan, or "swift-flowing river." Both of the main forks bear this name—North and South Saskatchewan—the former being fed by the largest glaciers, and flowing through regions where the rainfall is most abundant. The Brazeau and its other chief headstreams rise amid the glaciers of the Rocky Mountains immediately to the south of the sources of the Athabasca, their milky current flowing thence north-eastwards to their confluence with the Clearwater. Below the confluence the North Saskatchewan, winding between sandy, clay, and marly banks, remains a turbid stream especially during the floods. In the spring a few lakes send down a saline fluid, which dries up in the summer, Beaver Lake being the only lacustrine basin which sends a permanent emissary to the Saskat-

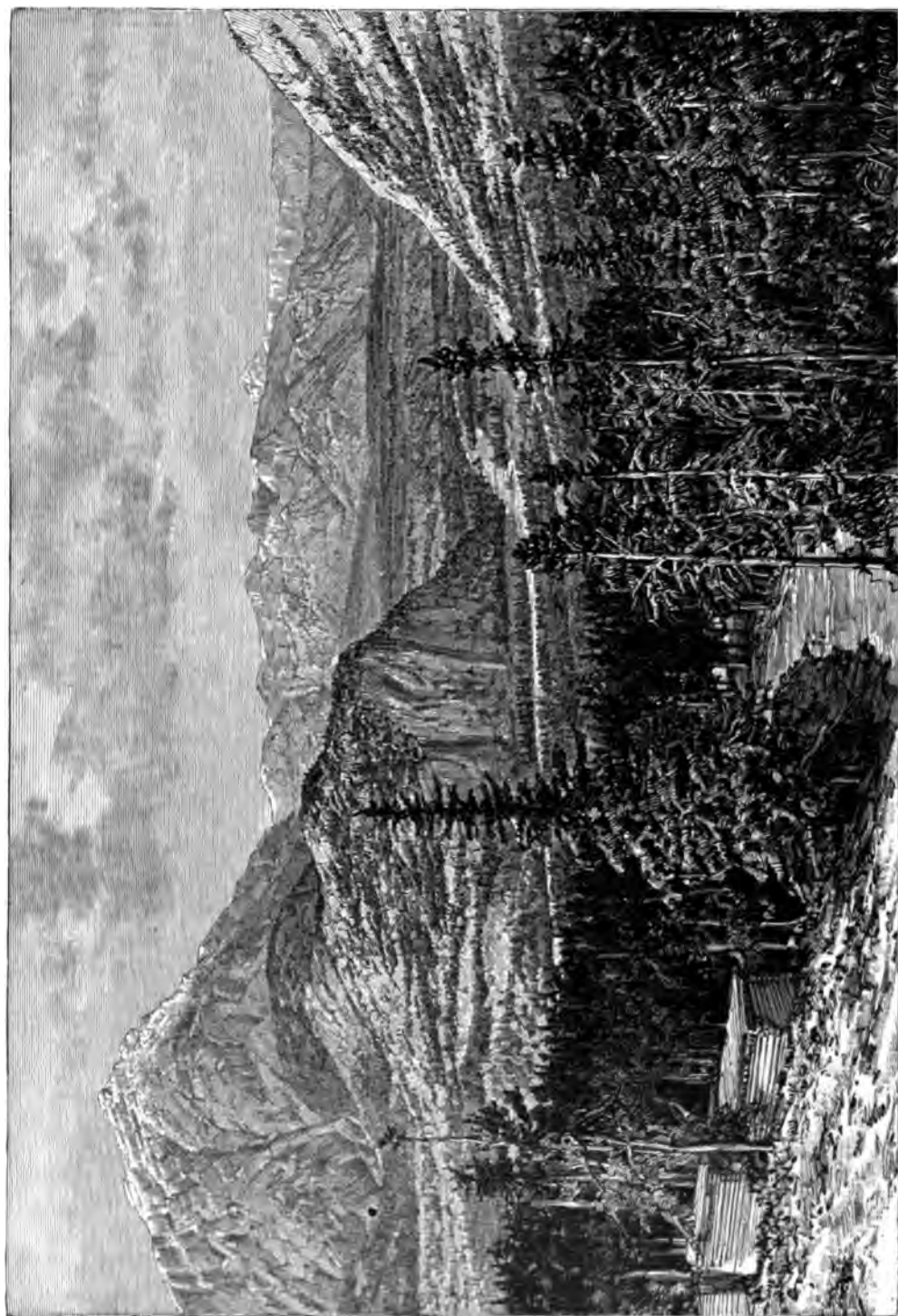
Fig. 85.—COULÉES OF THE GREAT PRAIRIE. ALBERTA.

Scale 1 : 1,800,000.



chewan. At the confluence of this tributary the main stream sweeps round the Beaver Hills, beyond which it trends south-eastwards along the foot of the Grand Coteau. In this part of its course it is joined by the meandering Battle River.

Like the north fork, the South Saskatchewan, better known because skirted by the Pacific Railway, is formed by numerous torrents flowing from the glaciers of the Rocky Mountains. Here the chief branch is the Bow River, which is followed by the transcontinental railway in its ascent to the Kicking Horse Pass. Rising in a glacial lake west of Mount Hector, the Bow River flows south-eastwards through the Banff Valley, and after receiving the overflow of the Devil's



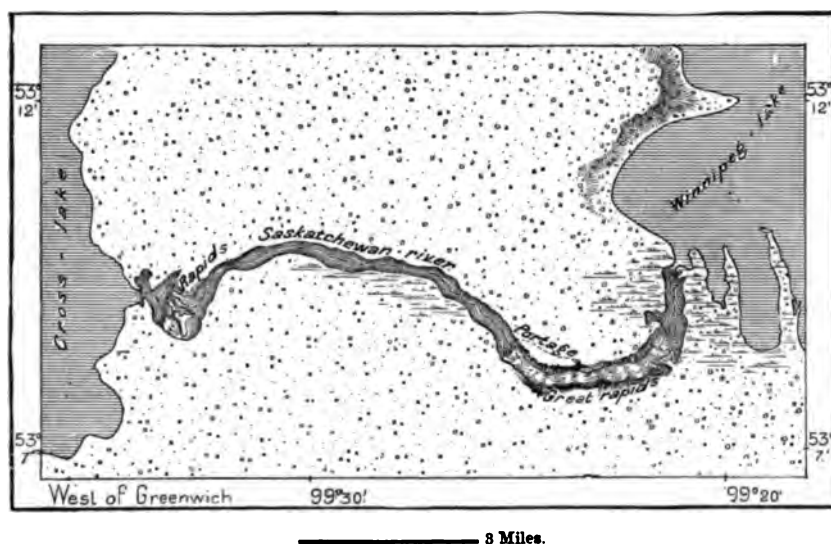
VALLEY OF THE BOW RIVER—BANFF HOT SPRINGS.

through in eddies and rapids much dreaded by the boatmen. Farther on the Saskatchewan winds between low banks across an old lacustrine basin of which a few reservoirs, with swampy margins, still survive. Such are the Moose Lake, the Devil's Drum, and Cedar Lake, this last being separated from the far larger Winnipegosis basin only by the mossy portage a little over 4 miles wide, which might easily be pierced by a canal. The Winnipegosis would thus become a tributary of the Winnipeg, the difference of level being only about three feet; in the spring all these lakes are united in a continuous sheet of water.

At the outlet of Cedar Lake the Saskatchewan crosses a limestone hill, where the swift current can be stemmed by boats, and farther on again expands to form the Cross Lake. Here the stream is still 54 feet above the level of Lake Winnipeg, which is only about 12 miles distant. Consequently the fall is here

Fig. 86.—THE SASKATCHEWAN RAPIDS.

Scale 1 : 200,000.



considerable, the river traversing two rapids successively, and then entering the lake through a formidable gorge 3 miles long, where it rushes at great velocity through yellowish limestone walls, on whose ledges are rooted a few trees. During a previous geological epoch the river doubtless plunged directly into the lake from a high rocky bed which has gradually been eroded and then transformed to a long gulley terminating at the two alluvial peninsulas which line the current at its mouth.

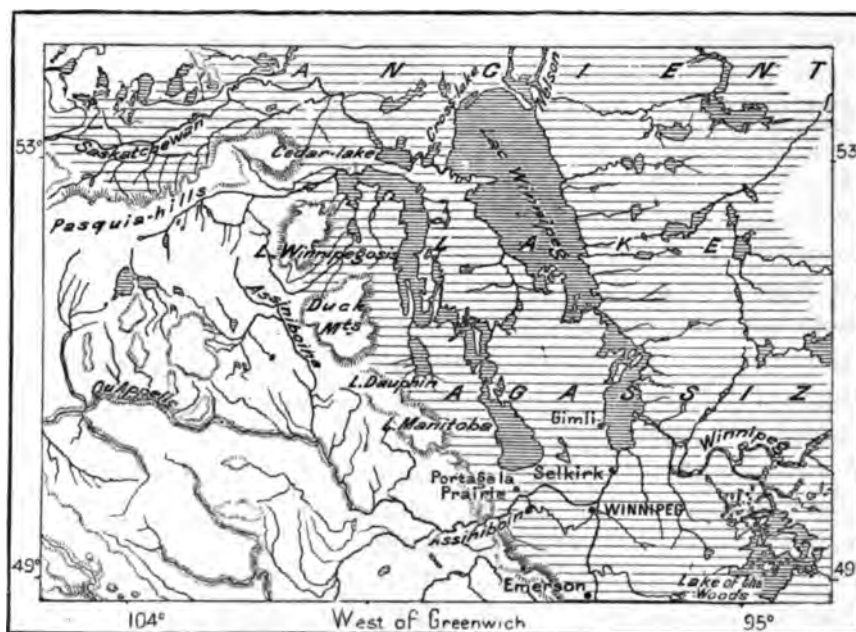
Besides the Saskatchewan, from which it receives over half of its supplies, Winnipeg is also fed by several other tributaries, amongst which is the Little Saskatchewan which enters the basin towards the middle of the west bank. This river is the emissary from Lake Manitoba, which gives its name to the central and most important province in the Hudson Bay basin. The depression which it occupies is disposed parallel with Lake Winnipeg, and both lakes are fragments

of the inland sea which formerly flooded the whole central region of the continent.

North-westwards Manitoba is separated only by a narrow isthmus from Lake Winnipegosis, or "Little Winnipeg," which is disposed in the same direction, the two basins having a collective length of about 250 miles, or nearly the same as Winnipeg itself. But they are narrower and shallower, and in summer Winnipegosis is somewhat brackish, owing to the copious saline springs near the west side. It stands about 20 feet higher than Manitoba, into which it drains through the Water-hen River. Manitoba itself is 40 feet higher than Winnipeg, to which

Fig. 87.—LAKE AGASSIZ.

Scale 1 : 8,000,000.



it sends its overflow through the stream which, farther down, after traversing another lake, takes the name of the Lesser Saskatchewan. It has been proposed to pierce the isthmus, about 12 or 14 feet high, which separates Manitoba from the Assiniboine River, a project which would double the extent of navigable highways about the city of Winnipeg.

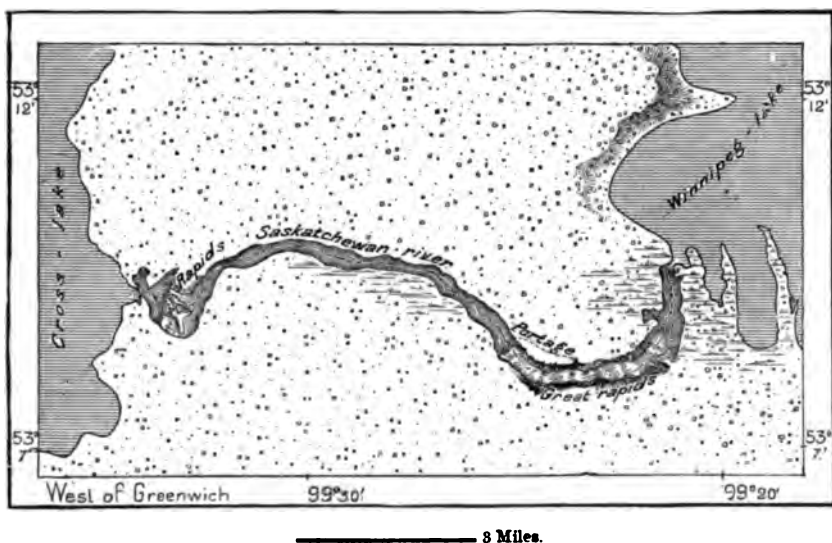
Although less copious than the Saskatchewan, the Red River of the North might from the geological standpoint be regarded as the main stream of the whole hydrographic system. It lies in the axis of the depression occupied by Lake Winnipeg, an axis which at the same time coincides with the central depression of the whole continent between the Rocky and Appalachian ranges. The Red River rises in the centre of Minnesota, about 1,300 feet above sea-level in the Elbow Lake,

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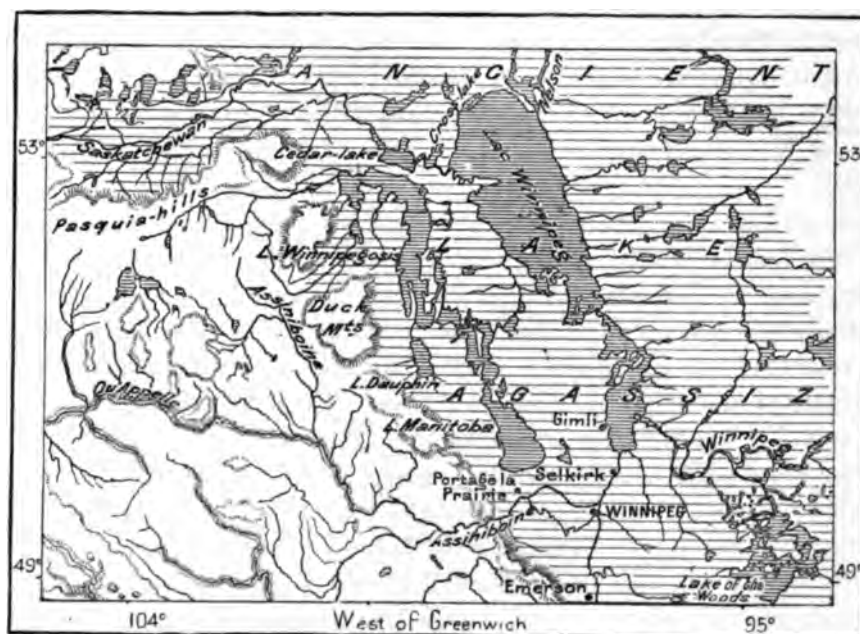
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whence it flows first south through a series of lakelets to the shallow Otter-tail Lake, thence sweeping round to west and south. In its upper course it thus describes a complete semicircle in the reverse direction from that of the Upper Mississippi, farther east. The common region of their sources is a typical lacustrine district containing over 700 lakes, some of which are of considerable size, so that in many places the watery element is more extensive than the dry land. Navigable canals might easily be opened between all these basins, from the Red River to the Mississippi and thence to the St. Louis and Lake Superior.

Geologists hold that beyond doubt the Red River was formerly a tributary of the Mississippi, through the Minnesota. Between the Traverse basin, whence flows an affluent of the Red River, and Bigstone Lake, source of the Minnesota, the divide is scarcely six feet high, and occasionally during the floods the northern sends its waters to the southern basin, thus temporarily restoring the old waterway. The upper Minnesota valley presents the aspect of a great fluvial bed, in which the present rivulet seems as if lost, and this valley is continued northwards by that of the Red River. With the eye we may follow the broad channel formerly excavated by the emissary of the great lake, of which only a fragment now survives.

The overflow of this basin, to which Warren has given the name of "Agassiz," must have been discharged southwards, for on the north side it was barred by the rampart of ice at that time covering the whole of boreal America. But when this barrier gradually retreated northwards, affording the overflow an issue through Lake Winnipeg and the Nelson to Hudson Bay, the southern watershed between the Minnesota and the Red River again arose above the surface, and the Red River ceased to be a tributary of the Mississippi.*

After escaping from the lacustrine region, the Red River winds northwards through a valley which mainly coincides with the meridian. From the Breckenridge meander to the political frontier the distance in a straight line is 190 miles, and 460 with all the windings. The fall is very slight, and at the frontier the placid current still flows 800 feet above sea-level through a prairie valley, whose uniformity presents a strong contrast to the aspect of most other rivers in their upland valleys. Its banks nowhere show any rocks except here and there a few erratic boulders, locally called "hard-heads." The soil everywhere consists of recent alluvia, resting on the sedimentary matter deposited by the former lake.

In its upper course the river, controlled by the numerous lacustrine reservoirs which it floods, remains at a somewhat uniform level throughout the year; but lower down, where it traverses the prairies, the winter floods rise from 34 to 40 feet above low-water mark, and here steamers have been seen carcering over the ploughed lands. These tremendous inundations are due to the irregular melting of the ice, which disappears first in the southern parts of the basin, where the water, being unable to break through its icy barriers farther north, accumulates and overflows its banks far and wide. At this period it is of a dirty white, not of a red colour, as might be supposed from its name. But according to the Indian legend

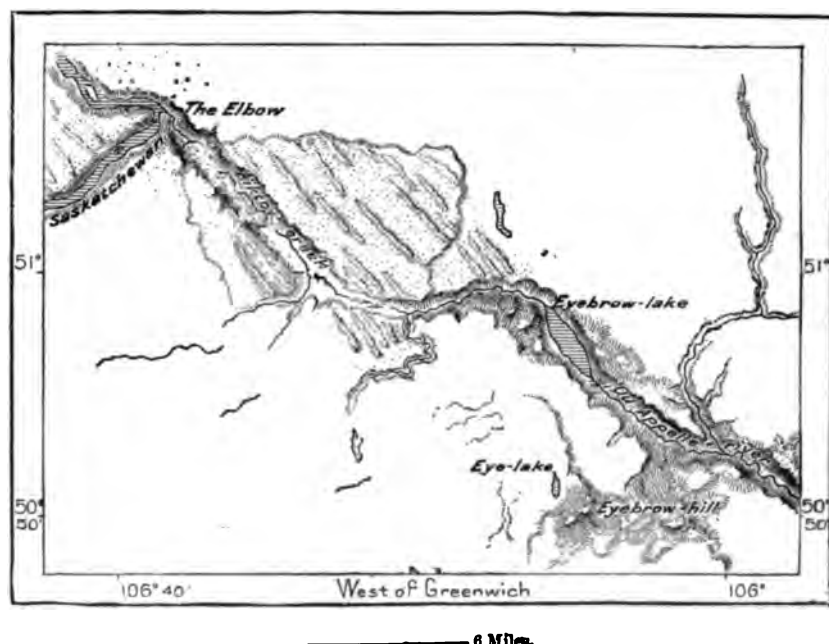
* Winchell, *Popular Science Monthly*, June and July, 1873.

this name has reference to the blood that mingled with the stream during a fierce battle between some Saulteux and Assiniboine tribes. At the point where it crosses the frontier, the mean discharge is estimated at 2,800 cubic feet per second.

In Manitoba the Red River receives the Roseau, the Rat and the Seine on its right bank, and on its left the Sale or Salle, originally Salée, that is "Saline," from the salt springs flowing to its channel. But on this left or west side the chief affluent is the Assiniboine, which gives its name to one of the great divisions of this region. The Assiniboine rises on an elevated part of the plateau west of Lake Winnipegosis, and flows at first south and south-east in the direction of the

Fig. 88 — BIFURCATION OF THE SASKATCHEWAN AND QU'APPELLE RIVERS.

Scale 1 : 570,000.



Mississippi. The plains traversed by it were till lately inhabited exclusively by the Saulteux and the Dakota Assiniboines from whom it takes its name. It is also known as Stony River, not so much from its rocky bed as from its shallow current for a great part of the year winding between argillaceous or sandy banks, which are fissured by the heat and then fall in great masses into the stream when swollen by the melting snows.

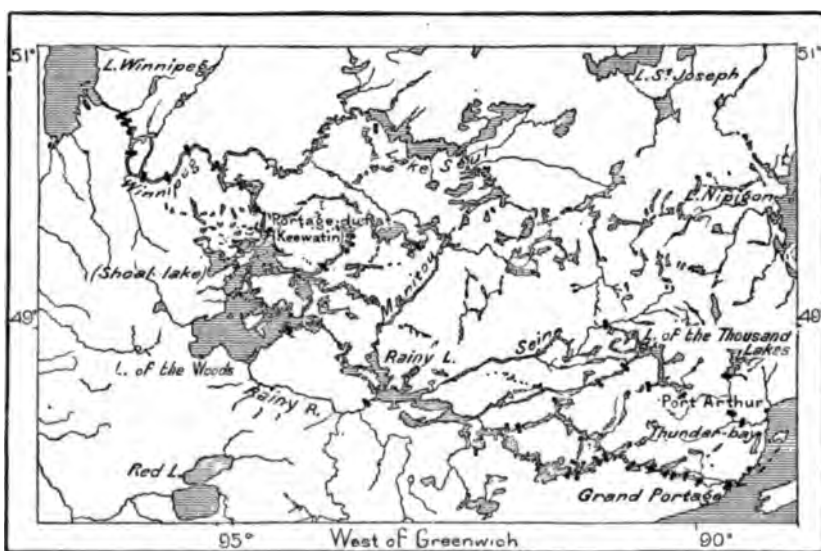
The Qu'Appelle, or Calling River, so named from the voice of an invisible spirit, joins the middle course of the Assiniboine, without, however, adding much to its volume, despite a course of nearly 400 miles. The discharge of the main stream itself scarcely exceeds 1,700 or 1,800 cubic feet per second in summer.

A remarkable feature of the Qu'Appelle is the continuous line of communication which it maintains with another river through a basin with a double outflow.

East of the "Elbow" of the South Saskatchewan, some sandhills, the highest of which rise from 60 to 70 feet above the ground, have gradually raised the bed of a deep valley excavated to a depth of over 100 feet below the plateau, without, however, completely filling it up, and the upper course of the South Saskatchewan is continued eastwards through this winding depression, which exceeds 5,000 feet in average width. At the point where the valley has been most elevated by the accumulating sands, some 70 feet above the low-water level of the Saskatchewan, the space between the dunes is occupied by a little basin which sends the Aiktow Creek in one direction to the Saskatchewan, and the Qu'Appelle in another to the Assiniboine. Along the bed of the latter a chain of narrow lakes at least 30 feet deep follows at intervals; of these the most remarkable are the four Fishing

Fig. 89.—PORTAGES OF THE OLD ROUTES BETWEEN LAKES SUPERIOR AND WINNIPEG.

Scale 1 : 6,000,000.



Lakes, which are separated by intervening alluvial plains deposited by the lateral torrents, the whole forming collectively a long basin of crescent shape.

A similar bifurcation to that of the Aiktow Creek is said to occur at the base of the long scarp formed by the Grand Coteau of the Missouri, where the two little "Mouse Rivers" would appear to flow from a common basin, one to the Qu'Appelle, the other to the lower Assiniboine.

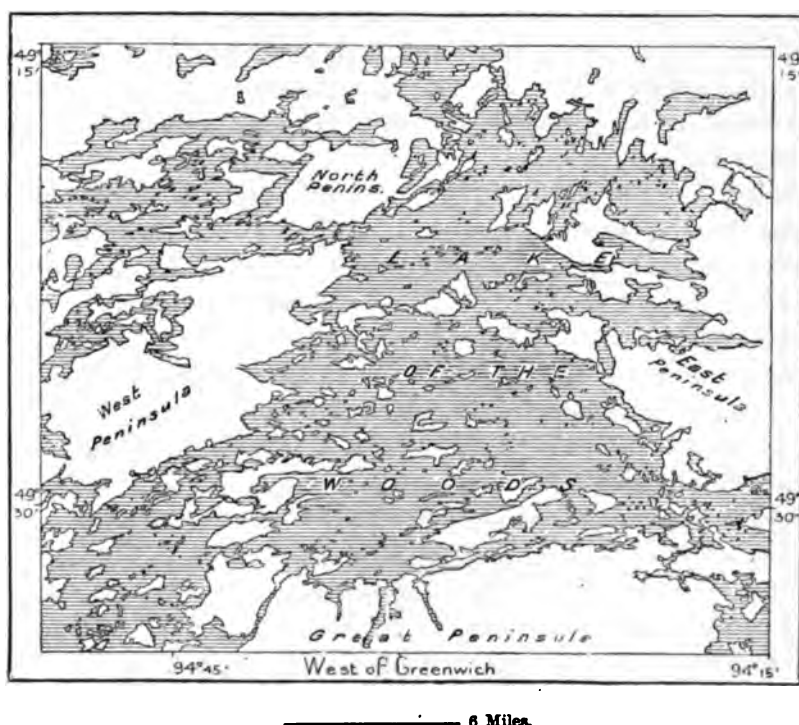
After receiving the Qu'Appelle, the Assiniboine, here flowing through a broad deep channel, trends eastwards in the direction of the Red River. In this part of its lower course it is joined by the Mouse, which makes a great bend in United States territory, and it then flows within a short distance to the south of Lake Manitoba to the Red River at the spot chosen as the site of Winnipeg City. During heavy floods, the Rat, flowing between the Assiniboine and Lake Manitoba,

is said to convey some of the Assiniboine waters to the lake. It would be easy to construct a canal across the isthmus, while a barrage would suffice to divert the South Saskatchewan to the Assiniboine through the Qu'Appelle, thus transforming these two watercourses into a continuous navigable highway. At present the Assiniboine is scarcely available for navigation, despite the length of its course, the main branch of which is alone estimated at 800 miles.

Below the capital of Manitoba the united waters of the Assiniboine and Red River keep the name of the latter stream, and continue to follow its general

Fig. 90.—LAKE OF THE WOODS.

Scale 1 : 450,000.



northerly direction. About 36 miles below the confluence the marshy plains through which the channels ramify present all the appearances of a delta, beyond which the vast expanse of Lake Winnipeg stretches away to the north. The time is approaching when this delta will merge in that of the river Winnipeg (Wi-nipi, or "Turbid Water," so named in the Kree language from the white argillaceous sediment held in solution in its current), which enters the lake some 25 miles farther to the north-east. Although a less copious stream than the Saskatchewan, the Winnipeg is historically more important as the natural highway of communication with Lake Superior and the other lacustrine basins constituting the Canadian Mediterranean. This route was followed by the hunting tribes, and after them by the Canadian trappers.

The river itself drains a considerable area, rising within 25 miles of the west

coast of Lake Superior at the "Grand Portage," a rising ground about 20 feet high, which forms the parting line between the two basins. From this point, which stands 1,440 feet above sea-level, all the waters flow from lake to lake through steep gullies, where the boats rush, the less dangerous rapids, and are carried across the portages where the falls cannot be navigated. Before the construction of roads and other improvements, the journey of 650 miles between the two great lakes occupied at least 28 or 30 days; in 1870 the British expedition sent to suppress the revolt of the half-breeds took three months to march from Thunder Bay to Winnipeg.

Of the other more or less difficult routes open to the daring trappers, one of the most frequented is that which has been chosen as the frontier line between the United States and the Dominion, and which the civil engineer, Dawson, has made comparatively easy by the construction of roads across the portages, and by canalising the lakes and connecting streams. Now, however, all these highways have been superseded by the Pacific Railway, which covers the whole distance in less than a single day.

The lacustrine region within the Dominion, separating the Superior and Winnipeg basins, is even more studded with winding and ramifying sheets of water than is the State of Minnesota about the sources of the Red River. Within a space 370 miles long east and west, by 185 miles north and south, the labyrinth of lakes is as endless as is that of the islets in the lakes themselves; everywhere an inextricable intermingling of land and water. Amongst the hundreds, the thousands of lakes, some are large enough to be regarded in any other country but Canada as great inland seas. Such is "Rainy" Lake, a term which, although adopted by the French Canadians (*Lac de la Pluie*), is really a popular English form of *René*, the name of its Canadian discoverer. The basin is encircled by dome-shaped cliffs from 300 to 500 feet high, with intervening swamps and thickets. The emissary, to which the misnomer "Rainy" has also been extended, never freezes above the falls by which its course is interrupted. The Rainy River flows between somewhat elevated banks, which were formerly shaded by large trees. But at a distance varying from a few hundred to a few thousand yards, the surface of the ground is little better than a quagmire resting on masses of peat, into which a stake may be driven some 30 feet without touching the bottom.

Of all the basins between Lake Superior and Winnipeg, the largest is the Lake of Woods, which is fed by the Rainy River, and which is no less than 400 miles in circumference. But it is divided by innumerable islets and promontories into secondary basins, which increase and diminish in extent with the floods and droughts. In the north-western part especially, the islands are numbered by the hundred, all varying in size, elevation, and the character of their flora. Some are merely grassy stretches almost flush with the water; some present wooded heights, and others rocky cliffs, either with vertical walls or else disposed in terraces, the whole offering an unrivalled variety of scenery. In some places the water is said to be 180 feet deep; but the average scarcely exceeds 30 feet.

Here occurs the so-called Canadian rice (*zizania aquatica*), the *folle avoine* or

"wild oats" of the Canadians, a plant characteristic of the Mississippi regions, and in Canada met only in the lacustrine district of the Lake of Woods. Westwards this lake is continued by a *muskeg* or peaty tract, which was formerly flooded, and which cannot be crossed except in winter, when the whole spongy tangle is frozen hard and covered with snow.

English River, which flows north of the Lake of Woods westwards to the Winnipeg River, is rather a succession of lakes than a river in the ordinary sense. Rising in the vast basin of Lake Seul, probably so named because of its desolate aspect, the English River forms the chief affluent of the Winnipeg River, which escapes through several channels, a kind of reversed delta, from the Lake of Woods, and which, during a course of 160 miles, falls 345 feet through a series of picturesque cataracts, whose lovely wooded islets contrast with the rugged granite rocks on both sides. According to Butler, the Winnipeg River has a mean discharge of about 140,000 cubic feet per second, or double that of the Rhine.

The vast reservoir of Lake Winnipeg, where converge the Great and Little Saskatchewan, the Red River, the emissaries of the Lake of Woods and Lake Seul, besides many other less important streams, is one of the great lacustrine basins of the globe, covering an area estimated at 9,000 square miles; it has a circumference of over 900 miles, and extends north and south at least 250 miles in a straight line. At its broadest part, opposite the mouth of the Saskatchewan, it is about 60 miles wide, but at the narrows it contracts to 6 or 7 miles. Winnipeg is thus disposed in two distinct basins, the "Little Lake" in the south, and the "Great Lake" in the north. The elevation is variously estimated at from 625 to 700 feet above Hudson Bay; but it is a very shallow basin, the deepest parts scarcely exceeding 70 feet, and in many places the mud and sand-banks are covered with only 2 or 3 feet of water for great distances from the shore, which is subject to great fluctuations with the alternating wet and dry seasons. Here and there crystalline rocks fringe the east margin; but the opposite side is bordered by low-lying and even swampy tracts for considerable distances, while towards the northern extremity the primitive contours have been masked by perfectly regular semicircular tongues of land, one of which bears the well-merited name of Mossy Point.

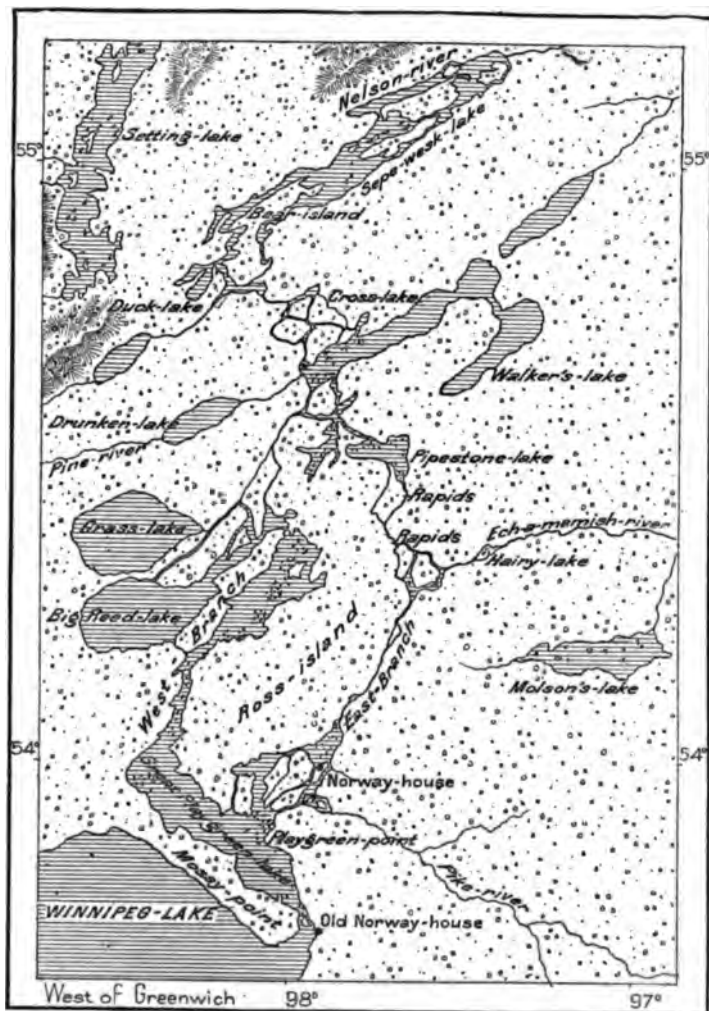
Under the shelter of this long and slightly elevated promontory are collected the effluent waters, which, after forming a winding lake, ramify round a large island, below which they again converge in a common channel. The Nelson, or Bourbon as this great emissary was formerly called by Canadian trappers, rolls down a liquid mass estimated at no less than 280,000 cubic feet per second. But despite its enormous volume, the Nelson is so obstructed by stupendous falls, rapids, and "cauldrons," that it is navigable only by canoes which can be transported overland across the numerous portages. During a course of about 400 miles it has a total fall of 650 feet. Below Lakes Fendu (Split) and des Muettes, its current becomes more tranquil, and deep enough for large vessels; but its mouth in Hudson Bay is obstructed by a shallow bar. It is noteworthy that, despite the quantity of sediment brought down, the Nelson has not developed a

delta beyond the normal coastline. It enters the bay through a funnel-shaped estuary, which penetrates a considerable distance inland, and which perhaps represents a partly obliterated fjord. On the banks of this estuary were interred, in 1612, the remains of the navigator, Nelson, whose name is perpetuated by the river.

On its south side the same estuary is reached by the York, or Hayes, formerly

Fig. 91.—THE NELSON EMISSARY.

Scale 1 : 1,400,000.



the Sainte Thérèse, which, like so many other watercourses in this region, is rather a chain of lacustrine basins, varying in size and connected together by falls and rapids. Being shorter, less meandering, and freer from ice in winter than the Nelson, the Hayes is used by the trappers as the trade route between Lake Winnipeg and Hudson Bay; they generally traverse the whole distance of 250 miles, including détours, in about twenty-five days.

The Hayes is one of those watercourses which present the rare phenomenon of a continuous flow to two different slopes. Near a place called the Painted Rock the current branches into two channels, one of which flows northwestwards to Hudson Bay, while the other joins the Winnipeg emissary.

Next to the Nelson the largest affluent of Hudson Bay is another "English River," called also the Churchill and the Missi-nipi, or "Great Water," which flows at an average distance of about 95 miles north of, and parallel with, the Nelson. Its farthest headstream, rising near Elk Lake, bears the name of the Beaver, and here it skirts the outer foot of the terraced moraines, which were deposited during the glacial epoch far to the east of the Rocky Mountains. After receiving the overflow of Lake la Plonge and of several others through the streams descending from the portage la Loche, it takes the name of Churchill. Lower down it continues to be fed by the emissaries of numerous other basins, the largest of which is Reindeer Lake, the most extensive reservoir between Lakes Winnipeg and Athabasca. But Reindeer, or simply Deer Lake, which covers an area of many hundred square miles, is wrongly represented on most maps as forming a water highway between the Churchill and Mackenzie basins. This phenomenon of bifurcation, of which several instances are found in Canada, does not occur here, for at this point two fluvial systems are clearly separated by a ridge of rising ground.

North of the Churchill other streams of much smaller size flow from the Keewatin plains to Hudson Bay. The largest is the Doobaunt, which, after traversing the lake of like name, enters the sea through the long Chesterfield Inlet, which is said to penetrate 250 miles into the interior. It is succeeded farther north in the direction of Melville Peninsula by the wider but shorter Wager Inlet. South of the Nelson and Hayes rivers the chief tributaries of Hudson Bay are the Severn, Weenisk, Equan, Attawapiskat, and Albany; this last has acquired a certain political importance as marking the frontier line between the province of Ontario and the Keewatin Territory.

Farther on the Original, better known by its English name of the Moose River, is the last important stream belonging to the western slope of Hudson Bay, which it enters at its south-east angle. It receives the overflow of several considerable lakes, including Abitibi, one of the most picturesque in Canada.

In all these secondary basins, as well as in those of Winnipeg and the Upper Mississippi, the lakes, whether still flooded or already emptied by fluvial erosion, are found to be encircled by terraces rising in irregular concentric lines above their margins. The watercourses themselves are similarly fringed at some distance from their banks by riverain terraces which seem to indicate the broad channels of communication between the inland seas. Certain cliffs may be traced for hundreds of miles, and their true character may be studied on those maps where the changes of water level are systematically indicated.

The marine shores themselves bear witness to secular changes of level. For a distance of about 200 miles between the mouth of the Severn and the Nelson estuary the seaboard is disposed in ridges running parallel with the coast, all

formed of gravel, and separated one from the other at intervals of from 350 to 1,350 feet by shallow meres, whose water near the coast is still brackish, but in the interior quite fresh. Everything seems to show that the ground has been gradually upheaved. The ridges lying farthest from the sea are always the most elevated, and the driftwood found in the intermediate depressions consists of tree stems at various stages of decomposition, according to their distance from the present beach.* Some are still found at an elevation of over 50 feet above the present sea-level. Certain indications seem to show that at the mouth of the Churchill the relative subsidence of the sea has been about six or seven feet since the last century.

HUDSON BAY.

This vast inland sea, so inappropriately designated as a "bay," must be regarded as belonging to the same geological region as the Winnipeg basin; it was formerly covered by the same ice-cap, and its bed is inclined in the same way as the plains which slope gently from the foot of the Rocky Mountains eastwards and north-eastwards. From the same plains the marine basin receives its most copious affluents, while the provinces of Ontario and Quebec, notwithstanding their proximity to the bay, at least on the maps, are in reality separated from it by an elevated parting line which is rarely crossed except by a few of the surrounding aborigines.

The vast plateau of Labrador also, which stretches east of the great northern "Mediterranean," constitutes a separate physical region, whose inhabited parts face towards the Atlantic. Even during the two and a-half centuries of rudimentary history which have passed over the boreal regions, Hudson Bay has always been intimately associated with the former territories of the company to which it gave its name. It was through the channel flowing between Labrador and Baffin Land, and through the waters of Hudson Bay, that the ships of the powerful association brought their supplies to the stations founded by the trappers. Through the same water highway the settlers in Manitoba and Saskatchewan expect one day to forward their produce to England. Their future shipping ports lie neither on the St. Lawrence nor on the Atlantic seaboard, but at the mouths of the Nelson, Churchill, and Moose rivers.

Including the secondary inlets and channels of communication, Hudson Bay covers an area estimated by R. Bell at 520,000 square miles. Even the Bay proper, enclosed by the northern islands of Southampton, Mansel† and others, has an extent of 320,000 square miles, that is, about the same as the western section of the Mediterranean from the Strait of Gibraltar to the Sicilian waters. Its whole catchment basin comprises a region of at least 800,000 square miles, or more than one-fourth of the Dominion. From the southern extremity of James Bay, the extreme southern inlet, to the eastern entrance of Hudson Strait, there is a clear navigable waterway of over 1,250 miles.

* A. P. Law, *Geological Survey of Canada*, Annual Report, 1886.

† *Mansel*, not *Mansfield*, as given on nearly all maps; so named by Button in 1612.

But notwithstanding its vast size throughout most of its expanse Hudson Bay is little more than a flooded depression, which would be transformed by a slight upheaval to a part of the surrounding mainland. The whole of James Bay is a

Fig. 92.—HUDSON BAY.
Scale 1 : 12,000,000.



sheet of yellowish water, where the muddy bed is churned up by the storm, and where vessels are exposed to the danger of grounding on the shifting shoals or on some low island, such as Agoomska or Charlton. Even the central parts appear from the few soundings taken here and there to have an average depth of not more than 435 feet, and such is the uniformity of the gently sloping bed, that

were it dried up it would present the same general aspect as the American prairies.*

Towards the centre and at the entrance the water is deeper, the soundings having recorded over 100 fathoms, while in Hudson Strait, through which the bay communicates with the ocean, the depth increases to 270 fathoms. The aspect of the shore corresponds as a rule with the depth of the neighbouring waters, being low where they are shallow, high and steep where they are relatively deep. On the coast of East Main, that is, the Labrador side, the waters are dominated by headlands 1,000 and even 2,000 feet high. The fauna is similarly varied, few marine fishes being found in the shallow, brackish waters of James Bay, whereas farther north the bay is frequented by nearly all the Polar species.

Parallel with the steep Labrador Coast occur the dangerous reefs of eruptive rocks known by the name of "Sleepers," and apparently representing an old coastline about 250 miles long. Towards the north the bay is separated by the large gneiss island of Southampton from the broad Fox Channel and other passages ramifying through the Arctic Archipelago. Till recently this island was supposed to be much more extensive. Now, however, it is known to be separated by Fisher Strait from a southern island not yet named on the maps, and about the size of Mansel Island, which lies to the east, and which resembles an enormous gravel table. Hudson Strait is likewise studded with islands, huge masses of gneiss and conglomerate plateaux.

Despite the shallow waters, the west side of the bay is nearly destitute of islands. The best known, as a rendezvous of whalers, is Marble Island south of Chesterfield Inlet, whose dazzling white cliffs, however, are composed, not of marble, but of a coarse limestone with white quartzites and micaceous schists.

The ocean tides are felt in all the inlets, but are much weaker in the south and west than in the north, falling from 35 or 40 feet at Ungava Bay, on the north Labrador Coast, to 12 or 14 in the Churchill and Nelson estuaries. From these tidal movements it has been argued that Hudson Strait can never be entirely blocked by ice, and that there is always an open passage through which the tidal waves are propagated. In such a climate, where the mean temperature is always several degrees below freezing-point, ice cannot fail to be abundant; but the secondary bays and inlets alone are completely frozen in winter. Still the navigation is discontinued during this season, and vessels seldom attempt the passage of Hudson Strait before July. They usually reach York station on the west side about September 4th, the earliest recorded being August 6th, the latest October 7th.†

Owing to the shallowness of the water, which is rapidly heated by the summer sun, nearly all the ice formed within the Bay is melted on the spot, so that very little of the floe ice drifts towards the Strait. The danger to navigation arises chiefly from the masses coming from Fox Channel in summer and obstructing Hudson Strait. These icebergs contain much mud and fragments of rocks, brought evidently from the islands of the Arctic Archipelago, and especially from Baffin Land.

* Robert Bell, *Geological Survey*, 1885.

† A. R. Gordon, *Report on the Hudson Bay Expedition of 1886*.

Other dangers arising from the currents, tides, and fogs greatly impede the navigation, which for sailing vessels is limited to two months in the year. So skilfully have these vessels been handled that before 1864, when two were wrecked on Mansel Island, not one of the 133 were lost which were despatched by the Hudson Bay Company since the year 1789. By the aid of steam the navigation will be better regulated, and kept open for about four months from July 1st to the end of October.

A more complete exploration of the seaboard will also probably discover the currents followed by the drift ice, and lay down the more favourable routes to follow. The first expeditions had been undertaken in connection with the researches for the North-West Passage, which was the exclusive aim of Hudson, Button, James, Fox, Munk, Gibb, Middleton, Smith. The same goal was pursued in the present century by John Ross and Parry, when they explored all the inlets of Fox Channel. But henceforth the attention of navigators will be concentrated on the bay itself, the character of its coasts, the constitution of its rocks, the force and direction of its tidal and other currents. This systematic exploration has already been begun on the south side, along the Nelson and Churchill estuaries, and in the islands of Hudson Strait.

CLIMATE.

The vast domain stretching from 49° north latitude to and beyond the Arctic Circle presents a great diversity of climates. While the isothermal line of 46° F. intersects the south-western region, in the north-east the mean annual temperature falls below 14° F., that is, nearly 20 degrees under freezing-point. In other words most of the territory, if not actually uninhabitable, is at least too cold for permanent European settlements. The true limit of colonisation is indicated by the isothermal of zero, which comprises all the upper Saskatchewan Valley and crosses the middle part of Lake Winnipeg, thus approximately coinciding with the monthly isothermals of 68° F. in July and 4° F. in January. Compared with the St. Lawrence basin, this southern zone of the Hudson Bay slope might contain many millions of inhabitants, and will probably contain them before many decades have passed.

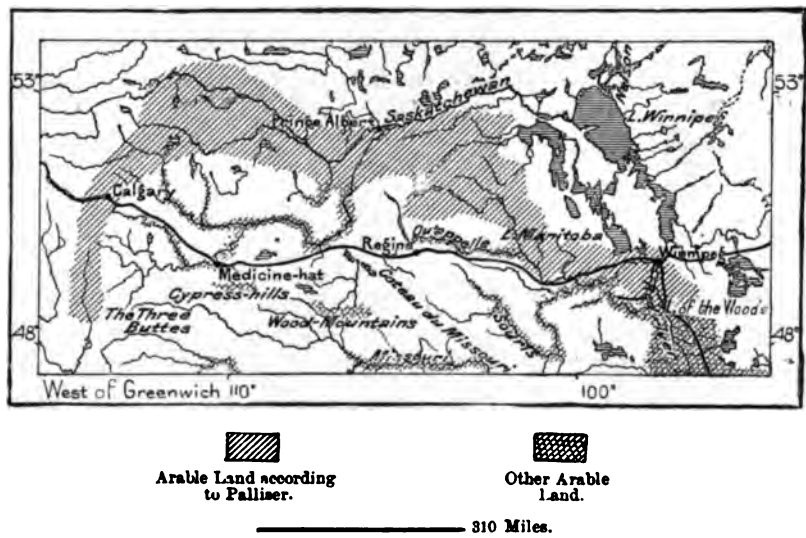
In the inhabitable region the climate is essentially continental, despite the vast expanses of water occupying a great part of the territory. The winters are very severe, the summers correspondingly hot, while the intermediate seasons, especially spring, are scarcely perceptible. Between the extremes the glass oscillates as much as 140° or 145°, and in Manitoba the discrepancy between the day and night temperatures is also greater than in any other British colony. In this respect the climate of the Winnipeg region recalls that of West Siberia. Yet these conditions agree perfectly with the general health and physical constitution of the white settlers, and scarcely any other region is more unanimously pronounced to be perfectly salubrious by the immigrants themselves. It is occasionally visited by fierce snow-storms; but these blizzards come, not from the northern but from

the southern regions, and are usually of a much milder type than in the United States.

In summer, after the sudden transition which changes the aspect of prairie and woodland as if by magic, the intense heats are tempered by the breeze which revolves with the sun. In this part of the continent, lying in the central depression about midway between the Polar seas and the Gulf of Mexico, the winds coming from the frigid and torrid zones, from the Atlantic and Pacific, are nearly balanced, the most prevalent being those of the west and south-west, that is, the counter-trades of the northern hemisphere. At the foot of the Rocky Mountains the so-called "Chinook" winds sweep abruptly down from the uplands and

Fig. 93.—ARABLE LANDS OF WEST CANADA.

Scale 1 : 18,000,000.



resume their original temperature, drying the ground, "lapping up the snow and drinking the water."

In some districts, especially south of the Assiniboine and Qu'Appelle rivers towards the United States frontier the chief drawback is the deficient rainfall. The yearly precipitation supposed to be indispensable for profitable corn-growing is estimated at about 20 inches, and this proportion is considerably exceeded in the central parts of Manitoba watered by the Red River, where most of the ruins occur in summer, precisely when most needed by the crops. But there are also vast tracts where the annual rainfall is less than 20 inches, and here stock-breeding rather than tillage will probably form the staple industry of the future.*

The panegyrists of Manitoba deny that the southern districts destitute of

* Meteorological observations on the Hudson Bay slope :—

	Annual Temp.	Extremes		Rainfall.
		Heat.	Cold.	
Winnipeg (49° 53' N.) . .	36° F. . .	95° F. .	—43° F. .	26 inches.
Fort York (57° N.) . .	22° . .	99° . .	—45° . .	32 „

arborescent vegetation, or even quite arid, suffer from a deficient supply of moisture. They protest especially against the term "desert" applied by Palliser to the region watered by the Moose River near the United States frontier. Anyhow this region is studded with saline lakes, and even contains a certain number of closed basins, such as that of the "Old Wives," where the water disappears without any visible outflow. Very probably the southern terraces of the province of Assiniboia owe their scanty vegetation to the slight rainfall. In this respect they form a northern continuation of the continental region in the United States, where is seen a gradual transition from the argillaceous and saline desert to the grassy plains, and from the prairies to woodlands and forests. Doubtless the tracts under timber have been considerably reduced by forest fires; but these ravages are themselves a proof that the local climate is not favourable to the development of large growth, and that, once destroyed, the forests are with difficulty replaced.

Before the white colonisation small woods of the willow, poplar, and aspen grew in the moist hollows especially at the foot of the dunes, and in the glens of the uplands improperly described as "mountains." The woodman's axe has been more destructive than the incendiary fires caused by the Indians.

FLORA AND FAUNA.

On the whole the general character of the Manitoban vegetation is much the same as that of Ontario, which, although lying more to the south, is traversed by the same isothermal lines. Nevertheless the beech, maple, and pine predominant in the southern province are not found in the Assiniboine valley, where even the oak and ash are rare. The commonest arborescent plants are the poplar, elm and willow, while here and there the wild briar, vine and other woody forms develop impenetrable thickets. The wild hop and other trailing plants spread their meshes over all the taller growths, and plants yielding berries of divers flavour and colour are as abundant as in the Muckenzie basin. Wild fruits, such as the plum and cherry, which in other provinces are very sour, have here quite a sweet taste, a phenomenon attributed by Macoun to the clear skies and dry atmosphere.

The dunes are nearly everywhere covered with a species of trailing juniper, and with the kinnikinnik (*arctostaphylos uva ursi*), the bark of which, mixed with tobacco, forms the most highly prized narcotic of the Indians and half-breeds. Two species of cactus range as far north as the Assiniboine basin, and the natives are also acquainted with a "fever tree," an aspen or trembling poplar, from the bark of which is prepared a decoction as a cure for the sharp attacks of ague.

West of the plains the foot-hills of the Rocky Mountains, and even the isolated Cypress Hills, have a distinct flora of an essentially alpine and boreal type, contrasting with the vegetation of the surrounding prairies.

The wild fauna comprises the same species as those of the conterminous lands; but several animals have already disappeared with the progress of colonisation. The "panther" of the trappers, that is, the puma (*felis concolor*), now very rare in the remote upland valleys, has long vanished from the plains. The wapiti also

is rarely seen, and still more rarely the cabri, or pronged-horned antelope (*antilocarpa americana*). The bison, herds of which are still said to survive in the Mackenzie basin, are now known only by tradition on the plains of the Saskatchewan, where they existed in countless numbers within the memory of man. They were systematically exterminated by the natives, the half-breeds and the whites, who formed a vast circle round a herd, which was gradually driven towards a palisaded or rocky enclosure, where all were slaughtered. The whites taking part in these butcheries often took nothing but the tongue, while the Indian used the flesh for food, the sinews as bowstrings or for sewing his garments, the skin for clothes, tent, or boat, the horns for keeping his powder. For a century the flesh of the bison had been the almost exclusive food of all trappers and travellers in the "Great Lone Land," where as many as ten millions were said to have roamed the boundless western prairies, and where a few of pure or mixed breed alone now survive in the preserves of some of the great cattle-breeders. As many as 230,000 are said to have been killed in the single year 1855 on the United States frontier.*

Of the smaller mammals the beaver, eagerly pursued by the trappers, has become rare, while the musk rat, protected by the nature of his retreats, still abounds in the boggy districts. The surprising fecundity of this animal, which breeds three times in the season, enables it to repair the losses caused by inundations and frosts penetrating too deeply into the ground or lasting too long. Fully as industrious as the beaver, the musk rat builds himself a spherical cabin by means of tall grasses interlaced and coated with clay. His bed of hay is placed above the level of the annual floods, and during the winter he maintains a system of ventilators in the ice of the neighbouring pond, his reservoir of fish, the holes being bordered with moss and plugged with clay. This is the only representative of the rat family in the Hudson regions; but there are several species of other rodents who burrow in the ground and feed on the roots of plants. Such is the so-called "prairie dog" or gopher (*spermophilus*, Frank.), which mounts guard in comic fashion at the mouth of its underground dwelling.

The feathered tribe, poorly represented on the prairies, offers great variety in the Manitoba valleys, where Macoun enumerates as many as 235 species. Most of them recall European forms, such as eagles, owls, cranes, duck, gulls, partridges, swallows, sparrows, and chaffinches. The blackbird is most dreaded as a greedy devourer of corn, while the cow-bird (*molothras pecoras*), which builds no nests, is a great favourite, often keeping company for weeks together with the waggon teams across the plains, perching on the horses and snapping up the gadflies and other winged pests. As in British Columbia, a Mexican humming-bird passes the summer on the Manitoban plains, and is met as far north as the Churchill valley in 57° north latitude. Thus this tiny creature, which glows like a burning coal in the foliage, makes a journey of at least 3,000 miles in spring and autumn between its winter and summer resorts.

Owing to the character of the soil and extensive river and lake systems, this region abounds both in fish and reptiles. In certain places the garter-snake

* Duncan G. F. Macdonald, *British Columbia and Vancouver's Island*.

(*Eutamias sirtalis*) may be seen in myriads coiled round the shrubs; lizards also swarm in the clearings, and have given their names to numerous lakes and mountains; frogs deafen the ear in all the marshy tracts, and in crossing swamps and streams the wayfarer runs the risk of being covered with leeches. But the tortoise is rare and never met beyond 51° north latitude.

Of the forty-two species of fishes enumerated by Moucon the most valuable for the natives is the whitefish (*Coregonus albus*), which is taken in multitudes in the Hudsonian lakes. These waters also teem with sturgeon, salmon, trout, pike, carp, and "loach" (*Lota maculosus*), the last mentioned being so named from its form and its gelatinous skin. The carp is noted for its almost incredible tenacity of life; after being frozen up in the ice it recovers when thawed out, and survives decapitation a long time. The earth worms, so common in the United States, are wanting in Manitoba and the North-West Territory, so that Darwin's theory as to the fertilising action of these organisms is not here applicable.

INHABITANTS.

The aborigines scattered over the vast region comprised between Hudson Bay and the Rocky Mountains east and west, the United States frontier and the Athabasca-Mackenzie basin south and north, belong almost exclusively to the widespread Algonquin family, which also at one time occupied nearly the whole of the St. Lawrence basin, and all the north-eastern states except the Iroquois enclave. The various tribes settled on the banks of the Saskatchewan, the Red River and Winnipeg are all allied to the Algonquins of Lower Canada and the States, the chief nation being the Krees, who also range northwards into the Mackenzie basin.

Before the period of colonisation all the aborigines were grouped according to locality and manner of life, into the two broad divisions of Prairie and Forest Indians. The former, who comprise the Blackfeet and neighbouring groups, the Krees of the Saskatchewan, and the Assiniboines of the Qu'Appelle, hunted the bison, and dwelt in camps, obeying warlike chiefs, and maintaining a constant state of hostilities with the surrounding tribes. The latter, called also "Stone," Stony, or "Thickwood," and comprising the Krees of the swampy districts and the Saulteux or "Fall Indians" of Manitoba, were partly fishers and partly hunters. Roaming the forests in small groups in pursuit of the deer, they were generally peaceful, the chiefs, where they existed, possessing merely a nominal authority.

Formerly the most formidable of these groups were the Blackfeet, who according to the national legend at one time dwelt on the alluvial plains of Manitoba, where the mud blackened their mocassins, whence their tribal name. Driven by the Krees to the western plains, they roamed till recently over the plateaux at the eastern foot of the Rocky Mountains between the headstreams of the Saskatchewan and the Cypress Hills. Nearly always at war with their neighbours, they were continually prowling round about the Krees in the east, the Assiniboines and Flat-

heads of the south and south-west, and the Kootenays of the west. The whites who visited their territory commanded their respect by constant vigilance and attention to their firearms.

Three bands, who call themselves kinsmen and who all speak the same language, form the Blackfeet Confederation. These are the Satsikas, or Blackfeet proper, the Keina or Blood Indians, and the Piegans (Pigan, Paegan), called also Pagans by English writers, either through a popular etymology, or because they long rejected Christianity; till recently they still continued to celebrate the feast of the Sun.

From a remote period the Sarsi or Gros Ventres, a branch of the great Arrapahoe nation, had also been admitted into the Blackfeet alliance, and for many generations took part in their plundering expeditions. They spoke both their native tongue and that of their allies, which for its softness and harmony has been called the Italian of those regions.

The Blackfeet were said to number 30,000 souls in 1836, that is, before the appearance of smallpox, and even about the middle of the century they were still estimated at 7,500. But in 1884 the three nations were reduced to 4,330, all settled in reserves which they are forbidden to leave.

The Krees, properly so called, formerly occupied the Red River basin, but they were driven westwards at an early date; before the white invasion their domain comprised all the prairie region stretching south of the Churchill to the arid tracts on the Dakota frontier. They contended with the Blackfeet for the possession of the western plains, but, like all the other Indians, they are now confined to reserves.

The Krees call themselves Nehiyawok, a word of doubtful meaning, but explained by Lecomte in the sense of "true men" or "chosen people." By their Chippeway neighbours they are called Kinistinok, the Knistineaux or Kristineaux of the early documents, of which Kree is supposed to be a contraction. Of all the Kree tribes those of the prairie appear to be of purest stock; they are also the most valiant and industrious, and speak the most elegant form of the national language, for which a special syllabic alphabet has been invented. This agglutinating idiom was adopted as a kind of *lingua franca* amongst the surrounding Chippeway, Assiniboine, Blackfeet, and Sarsi Indians, and the Krees also exercised a preponderating influence on their white visitors; hence the Canadian trappers (*coureurs de bois et de prairies*) almost exclusively selected their wives amongst these Indians. The French half-breeds generally spoke Kree, and many even became members of the maternal tribe.

The Muskegons, that is, Krees of the muskegs or swamps, hence called "Swampies" by English writers, have been long enough detached from the primitive stock to constitute a distinct group; their dialect, however, still resembles the Kree of the prairie more than any other Algonquin tongue. They occupy the marshy regions bordering the North Saskatchewan, Lakes Winnipeg and Winnipegosis, north of the Saulteaux or Chippeways.

As indicated by their French name, these Chippeways (Ojibways) formerly dwelt near the Sault Sainte-Marie, through which the overflow of Lake Superior

is discharged into the Huron-Michigan basin. The Assiniboinés, who dwell on the river of like name, in the neighbourhood of the kindred Sioux (Dakotas), take the name of "Stony," either from their arid rocky domain, or else from the primitive custom of boiling their cooking water by means of heated stones. Like the Krees they are divided into prairie and forest Assiniboinés, both equally reduced in power and numbers. Before 1780 they were said to be very numerous

Fig. 94.—BLACKFOOT INDIAN.



throughout the southern part of their territory, but were nearly exterminated by an epidemic of smallpox.

Although the Canadian Government has always treated the aborigines with kindness if not justice, they are none the less disappearing, and this decay would appear to be largely due to the policy pursued with regard to their lands. The trifling sums granted for the purchase of their territory were nearly always paid exclusively to the chiefs,* while the tribes themselves were removed to reserves, to which they were forcibly confined. The children also have been removed

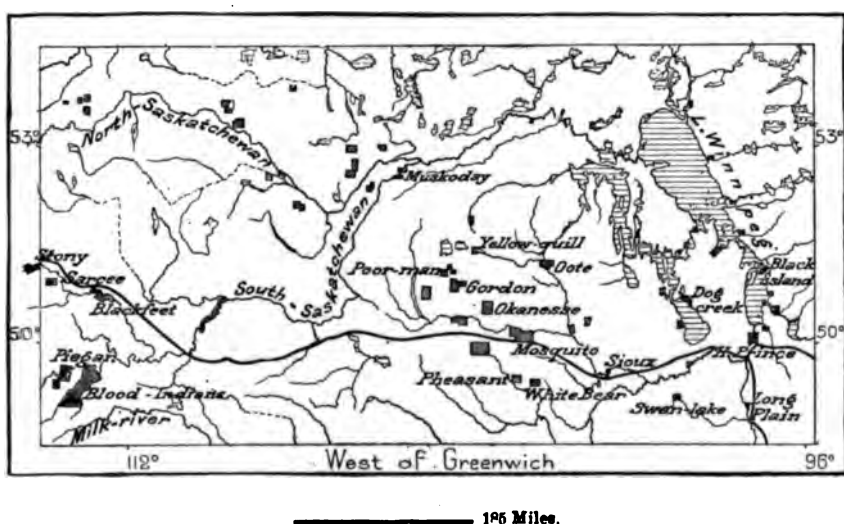
* Mean price of 18 million acres bought from the Indians, one penny per acre.—(Youle Hind.)

from the family influence, taught the English language and brought up to some agricultural or industrial trade, the result being that, though they may become useful citizens, they necessarily cease to be Indians.

The Red-skins have had to accept the new order of things, settling down in the various reserves assigned to them by the Government, unless they were willing to break the tribal connection altogether. But by taking this step they renounce their share of the collective pension, and accept a personal grant of land, thereby entering single handed into the struggle for life with their English neighbours. Lacking all national cohesion, they must henceforth gradually become absorbed in the working classes; they are already largely employed as navvies on the railways, as waggoners, herdsman, and on the drainage works. Many have

Fig. 95.—INDIAN RESERVES IN MANITOBA AND THE FAR WEST.

Scale 1 : 12,000,000.

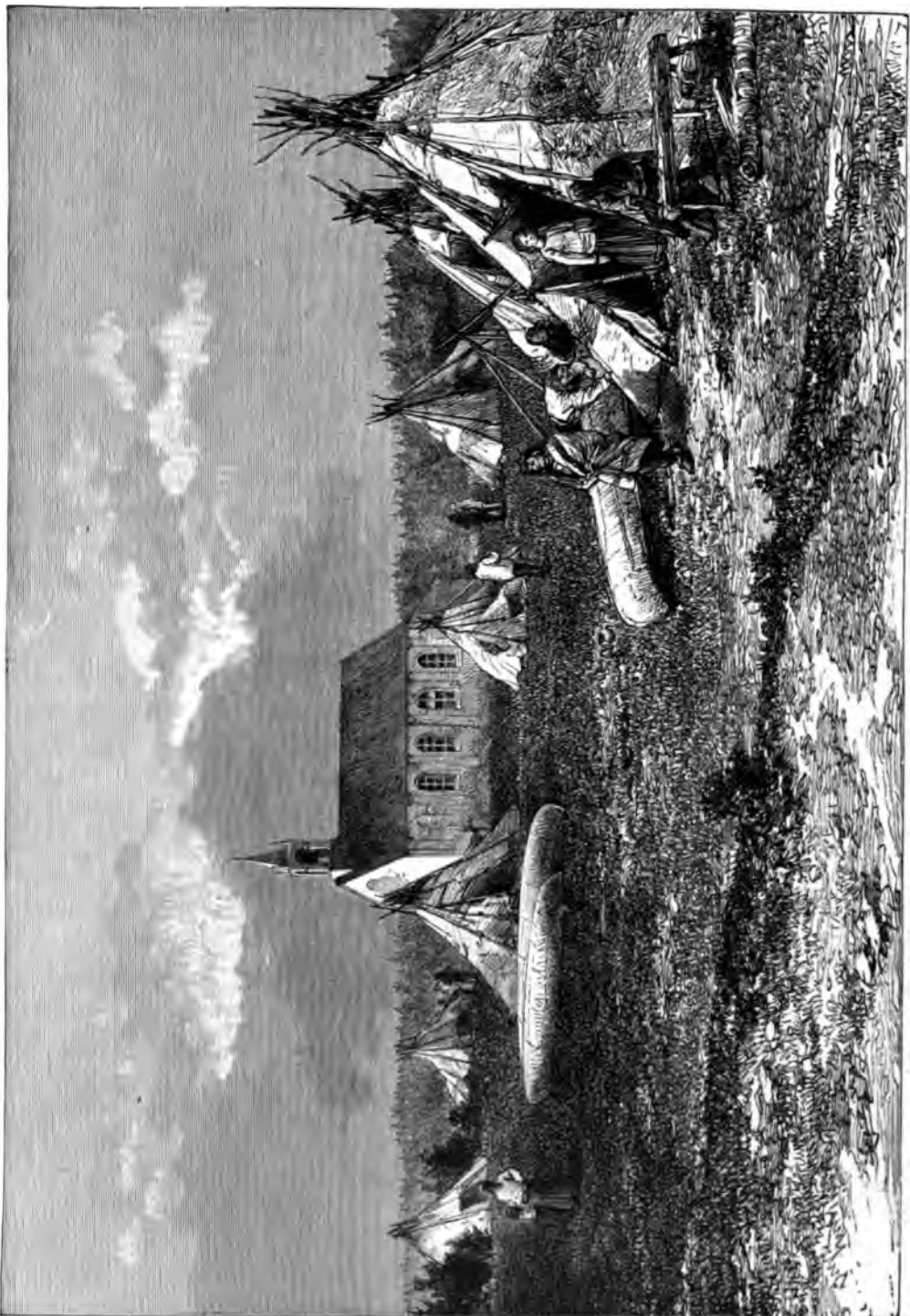


become successful agriculturists, especially along the banks of the Saskatchewan, where may be seen their well-tilled plots, neat cottages, outhouses, and agricultural instruments.

In the reserves the most fatal maladies are the measles and consumption, the latter especially amongst the children of the half-breeds; on the other hand the natives are said to be entirely free from cancer. Amongst the independent Indians the great scourge is famine, which has at times swept away whole tribes.

COLONISATION.

Although the colonisation of the Winnipeg basin has only recently been fully developed, it may be said to have begun with the explorations of Varennes de la Vérandrye (1731—1745), after which alliances between the half-breeds and the Indians became more and more frequent. In order to protect the peltry trade De la Vérandrye and his sons established factories on the lakes and portages, and



A STATION OF THE HUDSON BAY COMPANY.



Fort Jonquière, founded in 1752, is said to have stood near the foot of the Rocky Mountains on the site of the present town of Calgary.

The first colony, properly so called, was that organised by Lord Selkirk in 1811, when about a hundred Highlanders and Irishmen landed at a port on Hudson Bay, and after a hard winter passed in those inhospitable regions, made their way to the Red River basin. Here they were well received and provided with all necessities by the Hudson Bay Company; but dissensions soon broke out between them and the Company's servants, and this pioneer group, attacked by the half-breeds and savages, had to disperse. But ten years later, after the conclusion of the hostilities between the two rival Companies, the little Red River settlement was able to resume its peaceful career. For many years it was certainly the most isolated European settlement in the whole world; its most frequented highway of communication with civilised lands traversed 730 miles of extremely difficult ground, across lakes, rivers obstructed by falls and rapids, rocky portages and swamps, and terminating on the shores of Hudson Bay, an almost Arctic inland sea open to navigation only for two months in the year.

In 1870, when the monopoly of the Company was abolished and Manitoba constituted an independent colony, the civilised population of the Red River district comprised about 12,000 French and Scotch half-breeds. The *Bois-brûlés*, as the French half-breeds were called, were by far the more numerous, occupying the tract between the United States frontier and the site of the present town of Winnipeg. Some were also settled on the Assiniboine, and others on the Saskatchewan near Fort Edmonton. So little were they acquainted with the outer world that they called all whites "French," and one of Simpson's Canadian guides fancied all imported wares came from "*la vieille France de Londres*" ("Old France of London").

The "*Orcanais*" (Orcadians), as all the Scotch settlers were indiscriminately called, were chiefly established on the lower Red River near Lake Winnipeg. More than half of them spoke Gaelic, though the majority also understood English. The trappers employed by the rival French company ("*Compagnie du Nord-Ouest*") were also required to learn French. Thus it happens that many families of Scotch origin are now classed as French half-breeds, just as some of the *Bois-brûlés* call themselves Scotch.

But according to all observers, great differences exist between the two groups. The French half-caste is taller, more slim and pliant, and runs rather than walks.* He assimilates himself easily to the Indian, and his native wife becomes a real helpmate. His children combine with the cheerfulness, vehemence, and passion of the French the strength, pliancy, endurance, and marvellous skill in interpreting all natural phenomena characteristic of the Indian. They are generous, reckless, and improvident, born trappers, hunters, and traders, taking reluctantly to agriculture.

The Scotch half-breed, on the contrary, adapts himself with difficulty to the

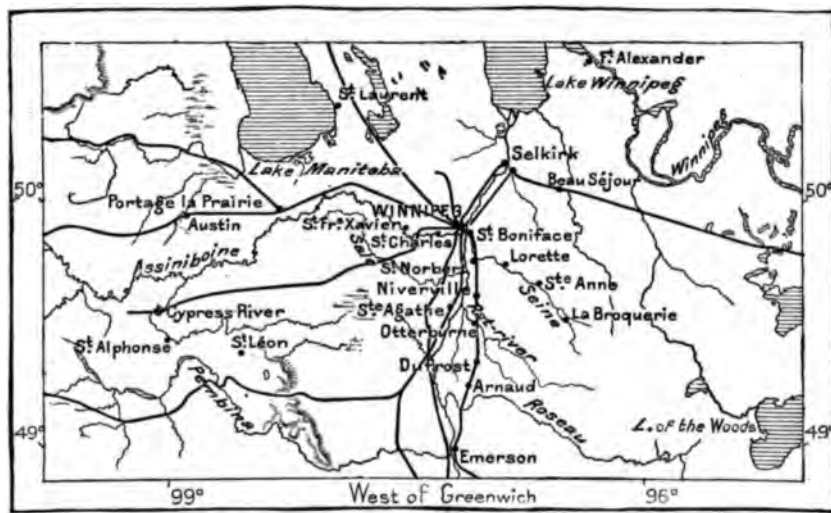
* H. Havard, *The French Half-breeds of the North-West*, Smithsonian Report; John Reade, *Proceedings*, &c., of the R. Society of Canada, 1885.

environment. His squaw remains his drudge, almost his slave, and his offspring seldom take after the mother, but like the father, are thoughtful, persevering, men of few words, agriculturalists for the most part, and stockbreeders.

With the abolition of monopolies, and the introduction of free colonisation, the relative proportion of the races was soon reversed. The immigrants were naturally drawn mainly from the neighbouring province of Ontario, settled almost exclusively by people of English speech. The European settlers came also nearly altogether from the British Islands, Germany, and the United States. At the last decennial census of 1881, the whole population was found to have increased fivefold since the middle of the century, while the pure or mixed French element had only doubled. The preponderance had therefore passed to the English-

Fig. 96.—CHIEF FRENCH CANADIAN SETTLEMENTS IN MANITOBA.

Scale 1 : 3,300,000.



speaking settlers, and the disparity steadily increases in their favour. At the same time, the number of their representatives also increases in the Legislative Assembly.

This change of ethnical equilibrium has not been effected without a certain ebullition of national feeling, and has even given rise to occasional political disturbances. The French half-breeds, suffering under real or fanciful injuries connected with the land question and their traditional privileges, have twice risen in arms against their British rulers. Both revolts were easily quelled by the Government, which was able to draw an unlimited number of English volunteers from Ontario, and now the Manitoban half-breeds appear to have frankly accepted the situation, and given up all thoughts of rebellion. But they also run the risk of being worsted in another and scarcely less important struggle. When the provincial government was constituted, both languages were regarded as possessing

equal rights, and all official documents had to be drawn up in English and French. Now, however, the British section protests against this arrangement, and not only insists on the exclusive use of English by the Manitoban Government, but also



Fig. 97.—FORT EDMONTON—SASKATCHEWAN RIVER.

demands the substitution of English for French in the French public schools, even in districts where the French element still predominates.

Such is the case especially in the valleys of the Seine and the Rat and in the southern and eastern parts of the Red River basin, in a few districts of the Sale,

Assiniboine, Qu'Appelle and Mouse valleys, on the shores of Lake Manitoba, in the Cypress Hills, and on both forks of the Saskatchewan. The French element is increasing by arrivals both from Lower Canada and the United States, and St. Leon, in the Pembina district west of Winnipeg, is peopled almost exclusively by Canadians from Massachusetts. In recent years a few hundred immigrants from France and Belgium (Wallons) have annually settled among their Canadian kindred.

A fresh stream of Scotch immigration, that of the Crofters from the Hebrides, has recently been directed towards Manitoba, and to all these French and British colonists have now been added other arrivals, especially from the north of Europe. Amongst these are the German Mennonites, who left Russia to escape from the military conscription, and settled in 1876, to the number of 7,000 or 8,000, in "reserves" granted to them on both banks of the Red River. They keep quite aloof from the surrounding populations, whereas the Scandinavians become rapidly anglicised. Many of these have settled along the Pacific Railway between Lake Superior and the city of Winnipeg, while thousands of Icelanders have occupied extensive tracts assigned to them on the shores of Lake Winnipeg. If this movement continues there will soon be more Icelanders in the Dominion than in their native land. They have already their own schools and newspapers, and amongst them the birth-rate is three times higher than the mortality.

Even some Mormons have found their way into the Alberta district, where they have settled on the river Lee, south of Calgary. They are chiefly recruited amongst the Scandinavians, but they have conformed to the laws of the land by renouncing polygamy.

Manitoba and the other regions of the southern zone are a sort of "land of promise," declared to be "the best wheat-growing country in the world." The great valley partly watered by the Red River presents considerable stretches of excellent arable land wherever the waters are not collected in stagnant lakes and swamps. The intermediate terrace also comprises vast tracts of productive soil, known as the "Fertile Belt," and the whole region, some 260,000 square miles in extent, favourable either for tillage or stockbreeding, is continually being enlarged according as the settlements spread north or west in the Saskatchewan basin. Here an expanse of about 80,000 square miles is fringed on the north by continuous forests, on the west by the Rocky Mountains, on the south by the prairies and saline plains, eastwards by the lakes and swamps. Within these well-marked natural frontiers, the land presents the aspect of a vast park pleasantly diversified with clumps of pines or aspens, grassy prairies, tall herbage, copious streams winding along the foot of gently undulating hills, lakes and lagoons flooding the depressions, and reflecting the surrounding verdure in their limpid waters.

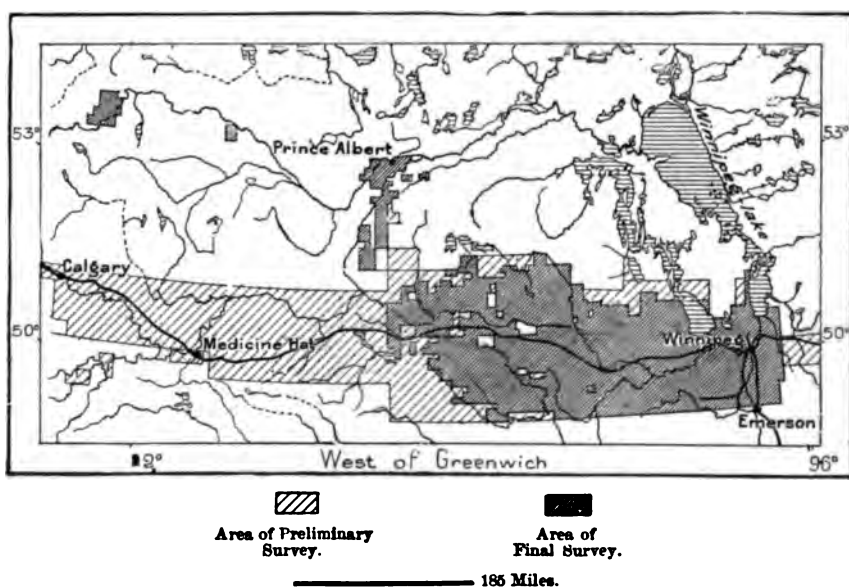
To the fertile soil corresponds a climate no less favourable for the growth of cereals, but, whatever may be said to the contrary, the average yield does not exceed 26 bushels per acre. Agriculturalists regard the severe frosts as an advantage for corn-growing. The subsoil, frozen to a considerable depth, thaws very slowly during the summer, thus continually liberating the moisture, which

gradually rises to the surface by capillary attraction. Other advantages are the dry winters and clear nights, no raw, damp, cold weather, nor any of those alternating frosts and thaws so trying to plant life. But in some disastrous years, the spring is accompanied by clouds of locusts (*calopterus spretus*) which are hatched on the plateaux of Montana and Dakota, and then move north-westwards parallel with the Rocky Mountains, devouring all green things along the line of march. In the year 1875 great ravages were caused by this plague.

The uplands along the slopes of the "Rockies," as well as all the fertile plateau region over 1,500 or 1,600 feet in altitude, are admirably suited for stock-breeding. Speculators have already introduced thousands of cattle, which in the single district of Alberta numbered no less than 113,000 in 1889. They live throughout the year on the runs, even in the depth of winter scraping up the

Fig. 98.—LANDS SURVEYED IN MANITOBA AND THE FAR WEST IN 1886.

Scale 1 : 13 000 000.



snow in search of herbage, and apparently less subject to disease than stall-fed animals, only during the prevalence of whirlwinds the calves and less hardy milch-cows have to be hand-fed.

Cattle have already begun to be exported, and despite the vast distance, the Alberta district now sends thousands by the Pacific Railway to Montreal, where they are shipped to England. Horse-breeding succeeds equally well in the "Canadian Piedmont," that is, in Alberta and Saskatchewan, and these regions are expected one day to become the chief centre of the industry in the Dominion. Since 1884 experiments have also been made with sheep-farming, with the result that all the imported breeds have thriven. In certain districts they have had to be protected against the wild dogs escaping from the Indian encampments and living like wolves by the chase.

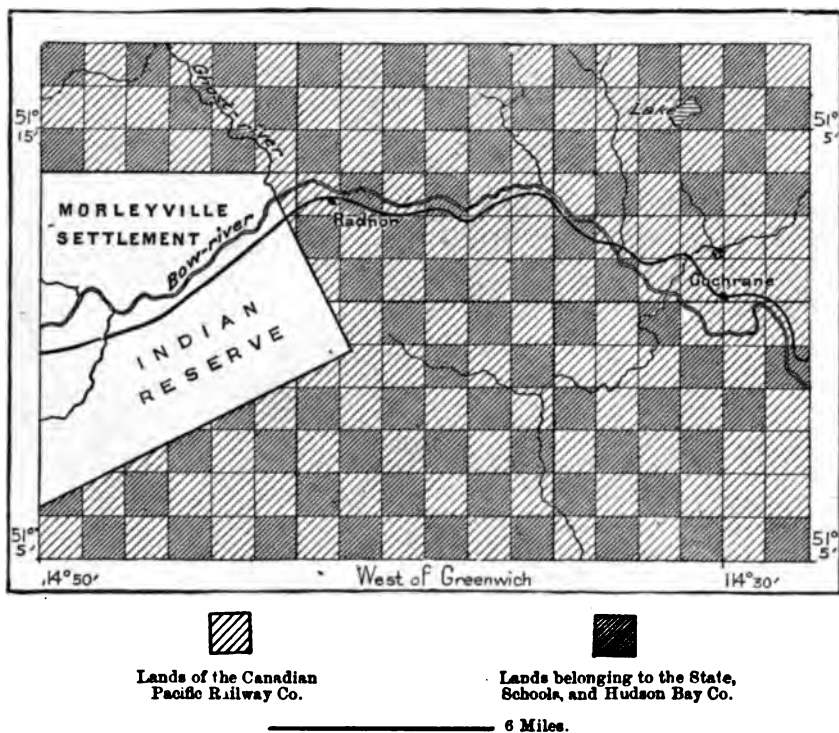
In the Red River valley the land has been parcelled out according to the old

Canadian method in parallel strips fronting the river and extending two miles back. But elsewhere the surveyed lands in Manitoba and neighbouring districts have been divided into townships, each forming a perfect square, whose four sides, six miles long, face the four cardinal points, and enclose an area of exactly 36 square miles. The townships themselves are subdivided into sections of 640 acres, or one square mile, one fourth of which (160 acres) constitutes the allotment assigned to each settler, who receives his title-deeds after paying ten dollars and keeping the plot under cultivation for three consecutive years.

The colonist has also the right of purchasing in the immediate neighbourhood of his homestead an equal number of acres, the price of which, as fixed by the

Fig. 99.—ALLOTMENT OF THE SURVEYED LANDS.

Scale 1 : 350,000.



Government, varies with their distance from the Pacific Railway. These inducements have doubtless attracted thousands of settlers, who, however, find that their allotments lie at an average distance of from 20 to 25 miles from the nearest railway-stations, while some are so remote as to be for the present at least quite useless. The farmer attempting to cultivate these parts is ruined by cartage. Hence he is compelled to buy land near the stations, where the ground not already granted to the Pacific Railway Company has fallen into the hands of the speculators.* Nevertheless, the value of all the land is slowly increasing, especially in the vicinity of the towns and stations.

On both sides of the trunk line and its branches the country has been divided

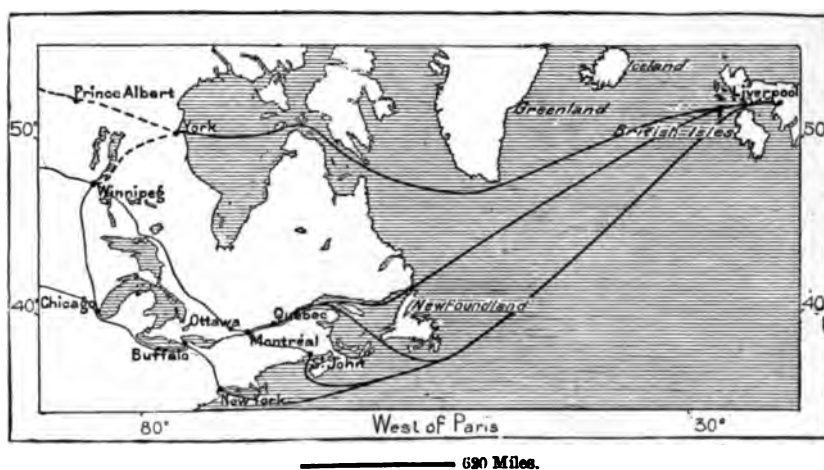
* Ingersoll, *Canadian Pacific Railway*.

into five lateral zones of varying width, where the upset price of the plots increases fivefold, from four to twenty shillings, in exact proportion to the distance. Nearly everywhere these lots alternate like the squares of a draughtboard between the two chief owners, the Canadian Government and the Pacific Railway Company; moreover two lots in every thirty-six are set apart for the public schools, and two for the Hudson Bay Company. The settlers are allowed ten years to pay the purchase money, which bears interest at six per cent. All this is very well for those who have the necessary capital, and who are able to anticipate the legal term of payment. But the majority have probably to borrow the money exacted by Government, the companies and private speculators, and may have thus to pay double interest before securing their title-deeds.

But despite these and other drawbacks, Manitoba is favourably distinguished

Fig. 100.—ROUTE FROM ENGLAND TO MANITOBA AND HUDSON BAY.

Scale 1 : 48,000,000.



by the relatively large number of its independent resident landowners; of 17,000 not more than 1,000 are absentees. At the same time great landed estates are already being developed, apart from those granted to the Hudson Bay and railway companies. A single farm in the Qu'Appelle valley covers an extent of 100 square miles, and the plough here drives a furrow four miles long.

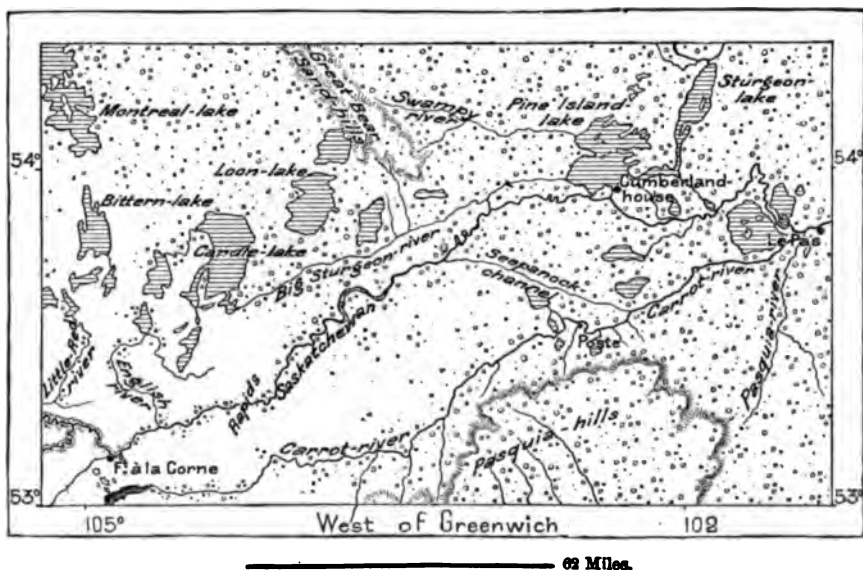
In these regions, railway enterprise precedes the arrival of immigrants; in fact the lots are not surveyed, nor the sites of towns and villages selected until the rails have been laid down. Besides the transcontinental trunk line and that connecting Lake Winnipeg with the Upper Mississippi basin, others have already been constructed connecting the lakes and rivers with the chief markets of the country. But one important project remains still unrealised, a line affording direct communication between the agricultural districts and their natural outlet, Hudson Bay. This sea is nearer to the city of Winnipeg than is the Gulf of St. Lawrence, while on the other hand the voyage is shorter between the Nelson and Churchill estuaries and Liverpool than between this port and New York.

Unfortunately Hudson Bay is closed even to steam navigation for at least eight months in the year, and wheat, the staple product of Manitoba, germinates at the very time when this inland sea becomes blocked with ice. Nevertheless, the economic conditions are being gradually modified by the progress of colonisation. A new railway running from the Red River to the confluence of the Saskatchewan has already diminished the distance, and the shortest line to England should now be drawn, not from Winnipeg City, but from the Saskatchewan "Horn." New industries have also sprung up, and ere long coal and petroleum as well as cereals will be exported from these regions.

TOPOGRAPHY.

The chief branches of the North Saskatchewan, flowing through a region still destitute of railways, possess no centres of population beyond a few trading stations.

Fig. 101.—CUMBERLAND HOUSE AND THE LOWER SASKATCHEWAN.
Scale 1 : 2,500,000.



The old *Fort Edmonton*, the nearest village to the sources, is already over 180 miles east of the Rocky Mountains. It stands on a high bluff on the north side of the river, which is here 660 feet wide. From this place runs the most frequented route towards *Athabasca-landing* at the head of the Athabasca-Mackenzie navigation. *Saint Albert*, a little to the north-west of Edmonton, is inhabited by agricultural Krees, who have already their houses, granaries and schools.

Below Edmonton follow at long intervals the little stations of *Victoria*, *St. Paul*, *Fort Pitt*, and the rising town of *Battleford* at the confluence of the Battle with the North Saskatchewan. Lower down come *Carleton* and *Prince Albert*, the latter capital of the Saskatchewan district, and connected by rail with Winnipeg. Its position in the Fertile Belt near the junction of the two forks of the Saskatchewan, and on the natural highway leading over the Loche portage northwards to



THE GREAT GLACIER, SEEN FROM THE RAILWAY BETWEEN BANFF AND HECTOR PASS.



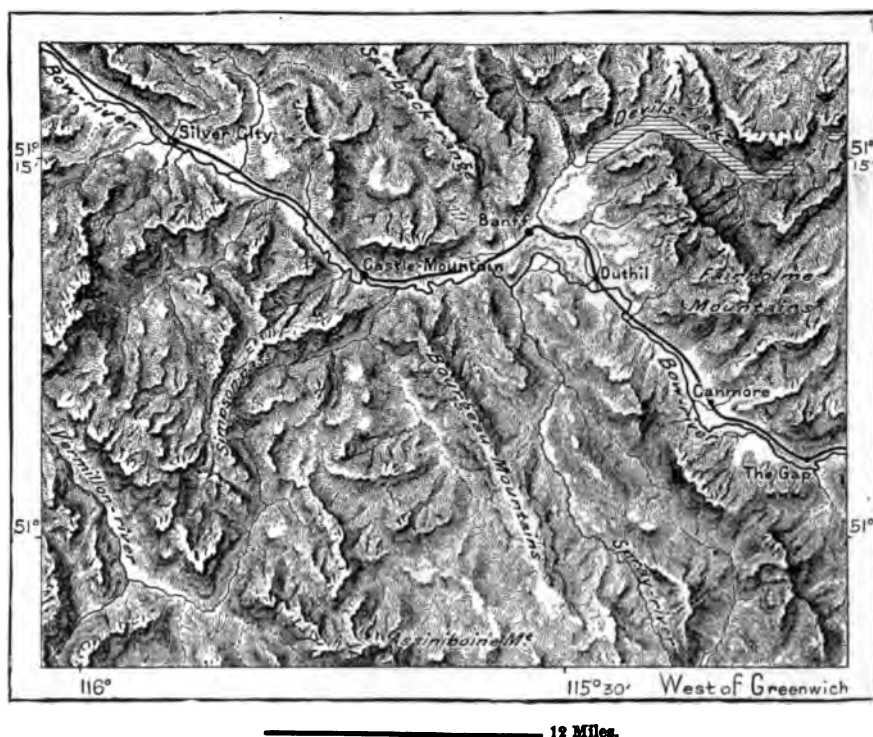
the Mackenzie basin, ensures for Prince Albert a dominant place amongst the future cities of the Far West. Yet a more convenient commercial centre would appear to be *Fort la Corne*, at the confluence itself of the two Saskatchewan.

Then follows the unproductive swampy region of the Lower Saskatchewan, where *Cumberland House*, or *Fort Cumberland*, was an important trading station before the abandonment of the old northern routes by water and the difficult portages.

The Upper South Saskatchewan basin presents a striking contrast to that of the northern fork in the density of its population and the number of its towns and

Fig. 102.—UPPER BANFF VALLEY—CANADIAN NATIONAL PARK.

Scale 1 : 550,000.



villages. This contrast is due to the Canadian Pacific Railway, which traverses the whole region, and winds its way upwards between the glaciers descending from the Rocky Mountains. Here is situated the rising town of Banff in a wild and romantic district, which with its magnificent cirque, cascades, forests and snowy crests, has been secured by the Dominion as national property. The thermal waters of Banff, which stands at an altitude of 4,500 feet, are frequented by a constantly increasing number of visitors.

Lower down in the same picturesque valley stands the flourishing town of Canmore, and quite on the plains 80 miles from Banff the still more important station of Calgary, the chief centre of the cattle and horse ranches of this extensive

stock-breeding district. Both Calgary and the pleasant little station of *MacLeod* (*Alberta*), on an affluent of the Belly River, are in the neighbourhood of coalfields which the lack of firewood in the prairie region must soon bring into requisition.

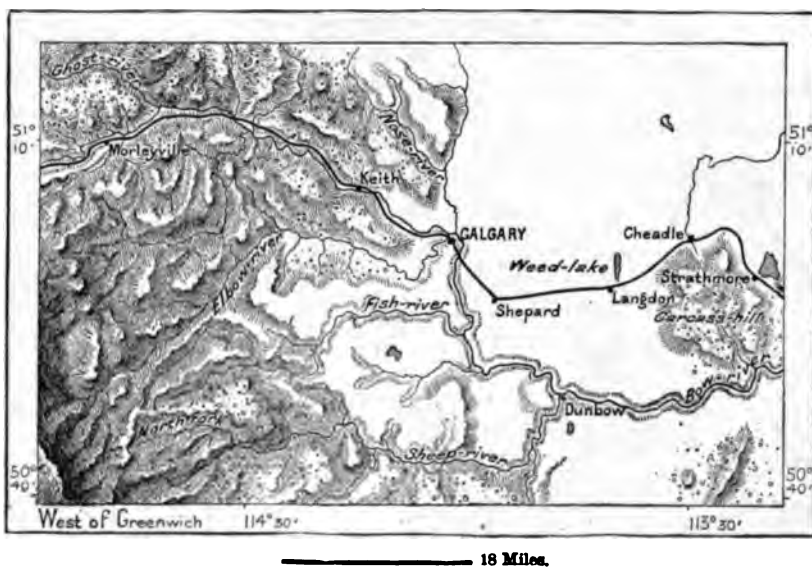
Medicine Hat, which occupies a favourable position at the south-west corner of Assiniboia below the confluence of the Bow and Belly rivers, and at the junction of two railways, also possesses coal-mines which are already being worked. *Batoche*, some 60 miles above the confluence, marks the scene of a victory gained by the confederate troops over the rebel Bois-Brûlés.

Regina, capital of Assiniboia, and seat of the legislature for all the western provinces between Manitoba and British Columbia, lies on the Pacific Railway and on an affluent of the Qu'Appelle in the eastern part of the district. In the Qu'Appelle valley the chief market also bears the name of *Qu'Appelle*.

Fort Ellice lies at the confluence of this river with the Assiniboine; it is

Fig. 103.—CALGARY—APPROACH TO THE ROCKY MOUNTAINS.

Scale 1 : 2,000,000.



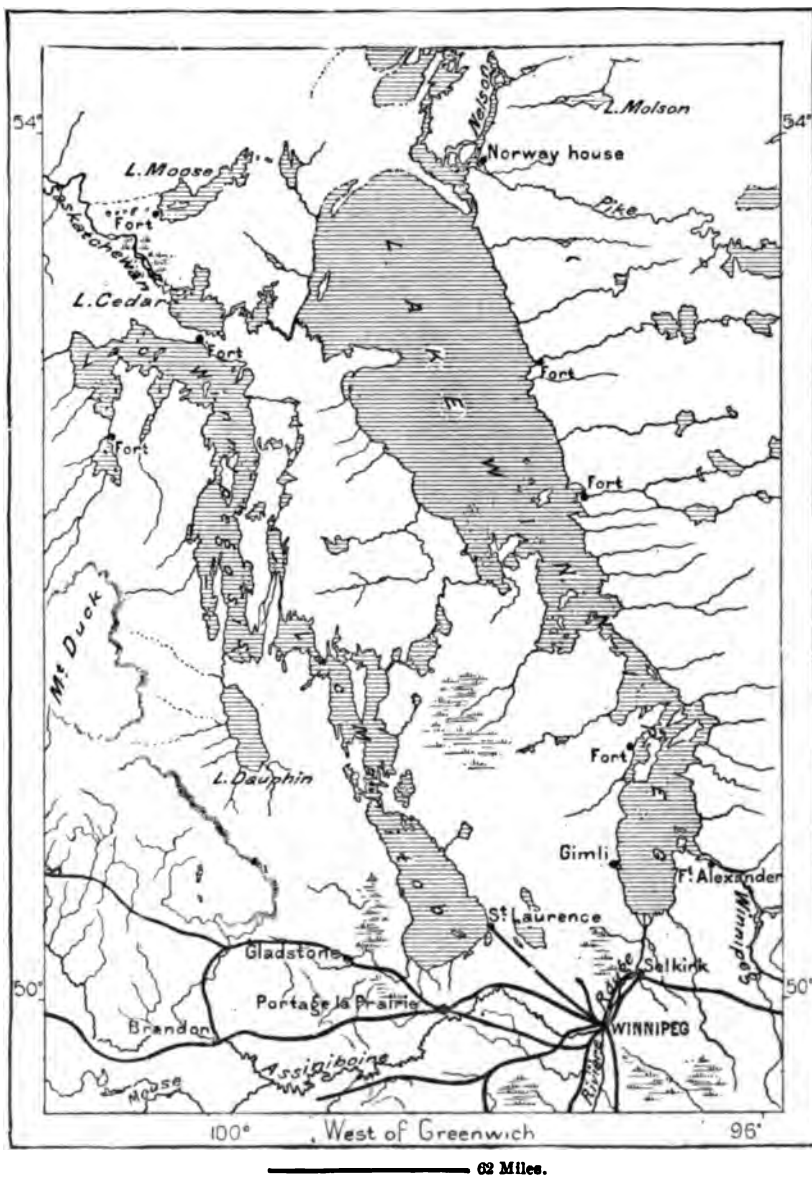
followed eastwards by *Birtle* (*Bird-tai*), *Minnedosa* and *Rapid City*, all on affluents of the Qu'Appelle. In the direction of Winnipeg the centres of population become more and more numerous. The flourishing town of *Brandon*, founded in 1879 on the south side of the Assiniboine, has increased rapidly, as has also *Portage-la-Prairie*, or simply *Portage*, built on an isthmus separating the Assiniboine from Lake Manitoba. This formerly swampy district has been reclaimed and is now the "garden of Winnipeg."

As early as 1734 the Canadian trappers had erected a little fort at the confluence of the Red River with the Assiniboine. On its site now stands the "queen of the West," the proud title arrogated to itself by *Winnipeg City*. Several trading stations had succeeded to the original post of *Fort Rouge*, and *Fort Garry*, the last of these fortified stations, was still in existence a few years ago.

But Winnipeg, properly so called, dates from about 1860, that is, after the abolition of the monopoly of the Hudson Bay Company. It increased with great rapidity after Manitoba had entered as a sovereign state into the Canadian con-

Fig. 104.—WINNIPEG AND ITS LAKES.

Scale 1 : 3,850,000.



federacy, and especially after the completion of the transcontinental railway, of which Winnipeg is the chief station between the province of Ontario and British Columbia. No less than six other lines of railway now radiate in all directions round the city, connecting it with the United States system, while another is being constructed in the direction of Duluth, the western emporium of Lake Superior.

Steamers ply on all the surrounding rivers and lakes, and Winnipeg like Vancouver may be said to have sprung from the ground. In 1868 there were no more than thirty houses scattered round about Fort Garry; at present the city possesses streets forty or fifty yards broad and over three miles long. Public buildings, hotels, and palaces line the chief thoroughfares, and parks have been laid out in the northern and southern suburbs.

Winnipeg, which in 1871 had not a single school, is now a university town with numerous denominational establishments affiliated to the central college. Till recently confined to the peninsula formed by the two converging rivers, the city has already spread beyond these limits, and on the right bank of the main stream has sprung up the almost exclusively French-Canadian town of *St. Boniface*. The college of this place is the oldest in Manitoba, dating from the year 1818.

South of Winnipeg the most important place is *Emerson*, centre of the Menonite settlement close to the United States frontier; it occupies both banks of the Red River, and is largely inhabited by Americans. Before the construction of the railways as many as 3,000 waggons annually passed through this station on the highway between Minnesota and Winnipeg, and in anticipation of this international traffic it received the name of the "Gate City" in 1874, the year of its foundation.

Selkirk, situated to the north of Winnipeg and on the same river, is also a new place, dating only from the year 1875. It stands on a bluff at the head of the fluvial navigation, which is interrupted higher up by the St. Andrews' rapids.

Beyond Selkirk in the direction of Lake Winnipeg begin the solitudes, where villages and stations become rarer and rarer. Nevertheless here has been founded the Icelandic settlement of *Gimli*, or "Heaven," a group of houses on the left side of the lake, where they are too much exposed to the periodical inundations. Opposite Gimli stands *Fort Alexander*, a French-Canadian colony commanding the mouth of the river Winnipeg.

Norway House, so called because founded by some Norwegian trappers in the service of the Hudson Bay Company, lies at the northern end of the lake near its outlet; but it stands in too remote a district to attract any settled population, and still remains a mere trading post and rendezvous for hunters.

From this point to *Port Churchill*, on the estuary of like name, the route along the watercourses and across the portages has a total length of 370 miles. Near the mouth of the river stand the ruins of the old *Fort Prince of Wales*, built of huge blocks of granite brought from Great Britain at a cost of over £120,000, a piece of extravagance which earned for the English the name of *Teo-Tinneh*, "People of the Stones." *Port York*, or *Nelson*, in a district growing potatoes, turnips, radishes, and even flowering plants, is annually visited by a vessel freighted with supplies for the barter trade with the natives. This place competes with Port Churchill for the honour of being selected as the future transatlantic packet station, possessing the advantage over its rival of lying nearer to settled and cultivated districts. But its port is shallow and of difficult access, while that of Churchill, though exposed to colder winds, is deep and better sheltered. Fort

York is the old *Fort Bourbon*, which the French Canadians twice wrested from the English, holding it till the peace of Utrecht in 1713.

Southwards along the shores of the bay follow other posts of the company, such as *Forts Severn* and *Albany* at the mouths of the rivers of like name, and *Orignal* or *Moose Factory* at the south-west corner of James Bay. This last, lying nearest to the great lakes (only 310 miles from Mishipicoten on Lake Superior), is the head of all the southern factories, and will probably be the first place on Hudson Bay to be connected by rail with the Canadian railway system.

V.—BASIN OF THE GREAT LAKES AND THE ST. LAWRENCE.

(PROVINCES OF ONTARIO AND QUEBEC.)

A part only of the vast basin drained by the St. Lawrence is comprised within the Canadian frontier. The chief, or at least the most copious headstreams doubtless flow through the territory of the Dominion; but to the United States belongs the St. Louis, that is, the watercourse which is usually regarded as the main branch of the river, because it lies along the geographical axis of the basin. Even a part of the northern shores of Lake Superior, together with its chief island, is included in the State of Minnesota, and the whole of Lake Michigan with all the surrounding coastlands also belongs to the United States.

East of the Sault Sainte Marie the political parting line follows the long axis of the lakes and their connecting channels, and even in the lower part of the basin, where alone both sides are assigned to Canada, some of the large tributaries, such as Lake Champlain, are excluded from her domain. The whole of the catchment basin of the St. Lawrence is estimated at about 586,000 square miles, of which less than one-half, say 280,000 square miles, lies within the Canadian frontier.

This territory, however, is incomparably the most populous and wealthiest part of the Dominion. Here are concentrated nineteen twentieths of the whole population, together with all the large towns, the industries, trading centres, educational establishments, in a word the political and social life of the country. Through the estuary and Gulf of St. Lawrence this section of British North America lies open to Europe, whence came the first immigrants, and whence are annually received fresh streams of population. From the historic standpoint also the shores of the St. Lawrence constitute what is popularly understood by the word "Canada" in a pre-eminent sense. So many conflicts have here taken place between savages and savages, between the red men and the whites, between whites and whites, this region has been the scene of so many sudden political convulsions and epic dramas, that, compared with the rest of North America, Canada alone might seem to have passed through a historic period. Even at present this history is continued by the peaceful rivalries of two peoples united by the same political institutions, but differing in speech, usages, religion, and even national aspirations.

POLITICAL BOUNDARIES.

Canada properly so called is about exactly divided between the two races, Ontario or the upper province being inhabited by peoples of English speech, and Quebec or the lower province, by the French Canadians. To these two provinces have recently been added the vast solitudes, which extend northwards to Hudson Bay, but which as yet possess no economic importance. The line of separation between Ontario or Upper, and Quebec or Lower Canada coincides very closely with the ethnical and linguistic parting line. It follows the course of the river Ottawa from the southern extremity of Lake Temiscaming to within a short distance of its confluence with the St. Lawrence. North of the lake the frontier, not yet accurately surveyed, runs due north to Hudson Bay.

North-westwards Ontario is separated from the Keewatin Territory by the Albany River, while its southern and south-eastern frontiers coincide with the boundary line between the Dominion and the United States. Quebec also is conterminous towards the south-east with the Great Republic, and is partly separated by Chaleur Bay from the British province of New Brunswick; but towards Labrador the boundary is purely conventional, following the 52nd parallel of north latitude. Eastwards Quebec is separated by Blanc-Sablon Bay on the Strait of Belle Isle from the maritime district of Labrador attached to Newfoundland.

PHYSICAL FEATURES.

The St. Lawrence basin, so remarkable for its vast lacustrine reservoirs, great fluvial artery and estuary, is traversed by no lofty ranges. Even about the region of the farthest headstreams the only rising grounds are gently inclined scarps and granite cliffs polished and rounded by old glacial action. But north of Lake Superior the ground rises gradually to the chain which forms the beginning of the border range to which Garneau has given the now generally accepted designation of the "Laurentides." This range, however, has a mean height of scarcely more than 1,500 or 1,600 feet, and Mount "Tremblante," some 60 miles north-west of Montreal, rises little above 2,000 feet, while the culminating points near the Saguenay appear to be only 4,000 feet high. They present a uniform aspect of rounded hills nearly everywhere covered with timber, separated by winding valleys with precipitous banks and by irregular lacustrine depressions.

The main axis of the Laurentides nowhere coincides with the *hauteur des terres*, that is, the watershed between the streams flowing on the one side to the St. Lawrence, on the other to Hudson Bay. Throughout its lower course and its estuary the St. Lawrence follows the direction of the longitudinal axis of the Laurentides.

Judging from the nature of the geological formations, this mountain system might appear to have its origin in the vicinity of the Frozen Ocean east of the Mackenzie. But the scientific surveys of those remote regions are still too defective to enable geographers to determine with accuracy the general direction of the main axis running north-west and south-east, where the relief of the land presents

rather the form of a plateau with denuded slopes than of a mountain range strictly so called.

Even in the province of Ontario nothing occurs except irregular masses of slight relative altitude, whose normal trend it is difficult to recognise. The so-called La Cloche "Mountains," north of the strait connecting Lake Huron with Georgian Bay, are scarcely more than 1,000 feet high. Those which farther east dominate Lake Nipissing range from 1,400 to 1,600 feet, and even towards the centre of Ontario between Ottawa and Toronto the culminating point does not exceed 2,300 feet. Interrupted by the Ottawa fluvial valley, the Laurentides are continued north-eastwards parallel with the St. Lawrence at a mean distance of about 30 miles from its left bank. North of Quebec it gradually approaches the river, where it develops the imposing headland of Cape Tourmente, nearly 2,000 feet high, followed lower down by the still more elevated and deeply ravined bluff des Eboulements (2,620 feet). Beyond the Saguenay the Laurentian system is continued along the estuary, where it merges at last in the granitic uplands of Labrador.

The Laurentides consist almost exclusively of metamorphic rocks, old sedimentary deposits afterwards highly crystallised during the course of ages. They are the oldest known stratified formations on the American continent, and probably correspond with the old gneiss formations of Scotland and Scandinavia. Throughout the whole orographic system the northern rocks were deposited at such a remote epoch that they have preserved no traces of animal or vegetable organisms. But the southern ranges belong to more recent periods, and here have been found some of the most remarkable fossil remains preserved in our geological museums.

Where the limestones crop out the soil is generally very fertile, and here nearly all the village settlements have been founded, the less productive gneiss and quartz regions being relatively uninhabited. Since the formation of the fossiliferous strata great changes have taken place in the relief of the land. In the clays of Montreal have been found the skeletons of a cetacean and of a species of seal, and higher up banks of like formation filled with marine shells occur 500 feet above the present sea-level.

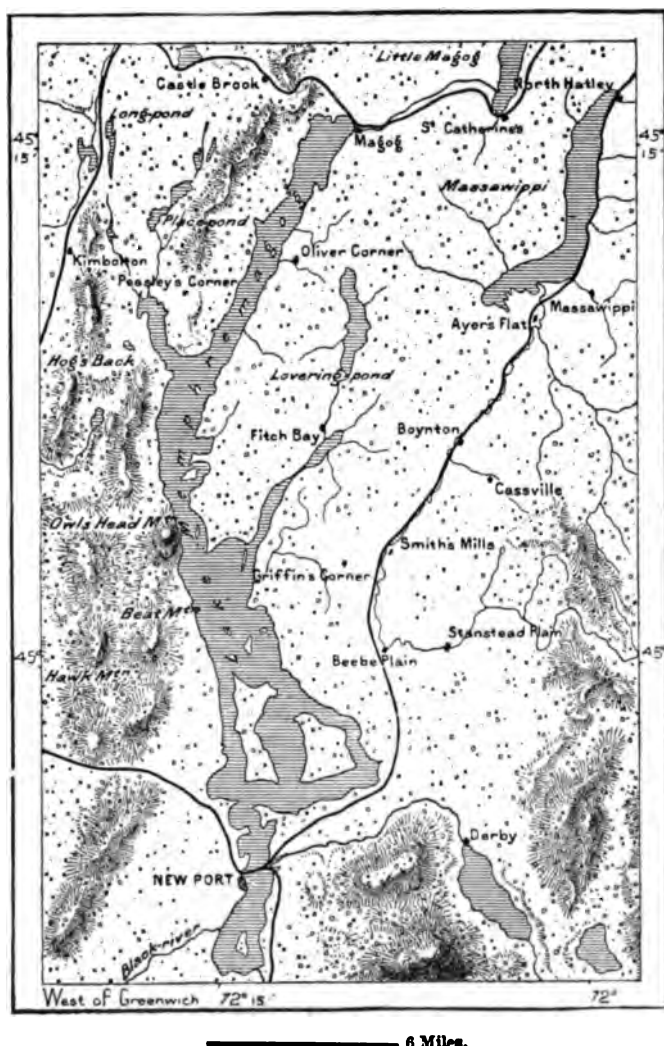
South of the St. Lawrence the heights skirting the river correspond in general disposition with the northern system of the Laurentides. Beginning abruptly with the Gaspé headland, they skirt the right bank very closely, leaving only a narrow beach between the water and their slopes. These heights, called the Shikshak Mountains in East Gaspé, present steep escarpments with rounded crests, of gloomy monotonous aspect, unrelieved by any variety of outline. Even the culminating-points, which fall below 4,000 feet, rise little above the mean altitude of the range. Farther east, where the system takes the name of Notre-Dame, the range gradually diminishes in height, and diverges somewhat from the St. Lawrence, ultimately merging in the waterparting between the estuary and the Atlantic.

Its ramifications, occupying the part of the province of Quebec called the Eastern Townships, are connected in United States territory with the Green Moun-

tains, that is, the chief terminal branch of the Appalachian system. The chains are broken by broad gaps, through which communication is effected between the Laurentian and Atlantic slopes. Such is the depression flooded by the elongated Lake Memphremagog, which runs parallel with the White and Green Mountains

Fig. 105.—LAKE MEMPHREMAGOG.

Scale 1 : 400,000.



east and west, and which sends its overflow through the St. Francis to the St. Lawrence.

Between the two ranges skirting the St. Lawrence the plains on both sides have been pierced by a few eruptive cones, such as the Mont Royal, which gives its name to the largest city in Canada (Mont-real). From the summit of this superb basalt eminence are visible other igneous heights, such as Montarville, rising above the low-lying plains between the St. Lawrence and the Richelieu;

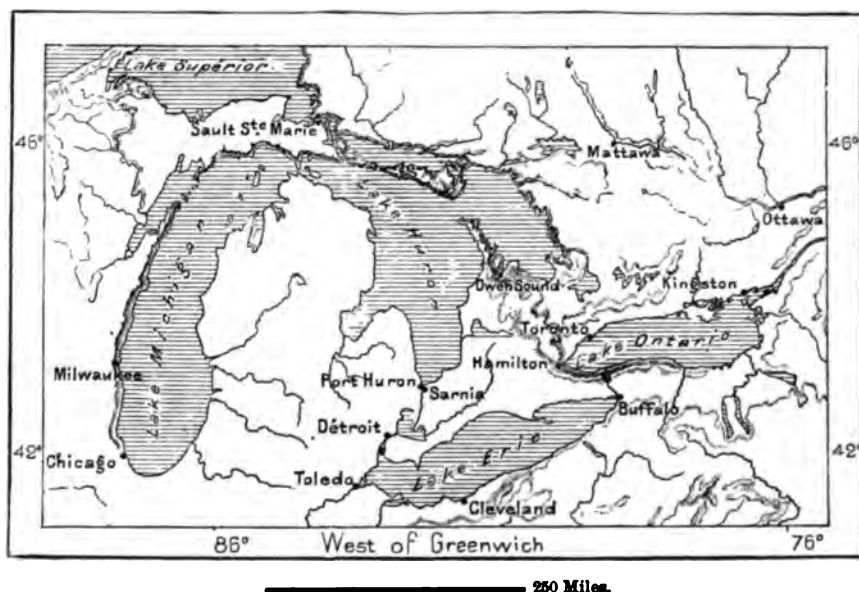
Belœil, so named from the fine view commanded by this isolated peak; Rougemont and several other eminences of volcanic origin.

The general aspect of the Laurentian basin, enclosed north and south by two ranges of vast antiquity and elsewhere occupied by more recent formations, bears evidence of the comparative repose which has prevailed throughout this region during a series of geological epochs. In fact the main geographical features of the land appear to have undergone little change, beyond those modifications due to erosion, and to the accumulation of glacial, lacustrine, and fluvial deposits.

A remarkable proof of this persistence of the main physical outlines is afforded by the shore-line, which is developed in semicircular form for over 600 miles from the southern extremity of Lake Michigan to the entrance of Georgian Bay.

Fig. 106.—SILURIAN ESCARPMENT BETWEEN CHICAGO AND NIAGARA.

Scale 1 : 11,000,000.



North of Chicago the silurian formations sweep round the Michigan waters, developing a regular line of cliffs along the west coast as far as Green Bay. Here they are interrupted by a broad gap, but are indicated by islands and reefs, and reappear north of the bay, running thence north and east along the north side of Mackinac Strait and Lake Huron. On its south side the large island of Manitoulin forms part of this silurian system, whereas the north shore facing the Laurentides presents very irregular outlines. The entrance of Georgian Bay forms another break, beyond which the escarpment is continued round the east side of Lake Huron along the foot of the so-called Blue Mountains, 1,500 or 1,600 feet high. It even extends across the province of Ontario in a south-easterly direction to the south side of Lake Ontario, where it is pierced by the river Niagara. The falls themselves stood originally at this point, but gradually receded southwards with the continual erosion of the fluvial gorge. From the same silurian limestone

cliffs were also precipitated the other cascades of the rivers flowing through the state of New York northwards to Lake Ontario, whose southern shores must at that epoch have presented a spectacle of stupendous magnificence. Farther on the escarpment is continued inland, extending north of the Mohawk Valley towards the Hudson, and at last merging in the Adirondack Mountains.

RIVERS AND LAKES.

The St. Lawrence is one of the great rivers of the globe whose geological history is least developed. Not more than about a seventh part of the whole catchment basin forms a regular fluvial bed, and even this watercourse expands at several points to fill such lacustrine basins as those of St. Francis, St. Louis, and St. Peter. All the upper part of the basin as far as the Thousand Islands is still occupied by the great lakes, themselves a remnant of the vast inland sea, which after the melting of the ice-cap stretched far into the interior of the continent. At its lower extremity also the so-called mouth of the St. Lawrence is merely a broad marine inlet; for this river has no delta and the sea may be said to begin at Quebec. Evidently it is of relatively recent formation, young, for instance, as compared with the Nile. Even where it assumes the character of a river in the strict sense, it has not yet succeeded in regulating its banks by developing a regularly alternating succession of normal meanderings in accordance with the law of "reciprocal curves."

LAKE SUPERIOR AND ITS AFFLUENTS.

The vast lacustrine basins of the upper course, which formerly drained on the one hand towards Hudson Bay, on the other towards the Gulf of Mexico, but which at present belong to the Laurentian slope, still continue the process of exhaustion by the accumulation of sedimentary deposits, but with extreme slowness. The surrounding heights are of low elevation and consist of hard rocks, which resist the action of water and weathering. On the other hand the tributary streams are mostly lacustrine emissaries, bringing down little sediment and holding nothing in solution except chemical substances. Then the great lakes themselves are so vast and so deep, that the alluvial matter deposited by these tributaries seems infinitesimal.

It is further to be considered that long geological ages will be required to wear away the fluvial beds at the outlet of Lake Ontario, at Niagara Falls between Erie and Ontario, and at the Sault Sainte-Marie ("Saint Mary Falls") between Superior and Huron. Nevertheless a rough estimate may be formed of the time needed to empty the Canadian "Mediterranean," and thus convert the St. Lawrence basin to a normal watercourse from its source to its mouth. If 45,000 years be required to efface the comparatively insignificant Lake of Geneva fed by the Rhone and the Dranse, both rich in sedimentary matter,* it would take their limpid affluents at least 50 million years to fill up the great Canadian reservoirs.†

* F. A. Forel, *Bulletin de la Soc. Vaudoise des Sciences naturelles*, November, 1888.

† Greenleaf, *Water-Power of the North-Western States, United States Census for 1881*, vol. xvii.



VIEW ON THE RIVER NIPIGON.



The St. Louis is regarded as the main branch of the St. Lawrence, because it falls into the western or farthest extremity of Lake Superior. Nevertheless this lake receives other affluents quite as large and even larger than the St. Louis, which, although rising 30 miles north of the lake and over 60 miles from its western extremity, has its source in United States territory in the midst of a lacustrine district standing about 1,000 feet higher than Lake Superior. After flowing west and south-west as if to join the Mississippi, with which it might easily be connected by a canal, the St. Louis trends east and south-east, traversing an extremely rugged district through a series of falls and rapids constantly varying in form and height. In the 12 or 14 last miles of its course it has a total incline of 460 feet, with a mean discharge of about 1,200 cubic feet per second.

At Thunder Bay on its north-west side Lake Superior receives the contributions of the Kaministiquia, whose basin is entirely comprised within Canadian territory. From the peaty ground where it rises this river receives a blackish water charged with vegetable humus, and flows sluggishly through an almost flat plain to the picturesque island-studded Great Dog Lake. At the outlet of this reservoir the Little Dog River, as it is here called, descends rapidly over a series of six falls, whose foaming waters rushing between pine-clad slopes may all be seen from several projecting ledges. Lower down the Kaministiquia, or "Wandering River," escapes from the region of gneiss and granites, and at Kakabeka, the "Split Rock," develops a magnificent fall 120 feet high above the delta where it enters Lake Superior through three branches.

Eastwards follows another considerable affluent, the Black Sturgeon. But the most copious feeder of Lake Superior is the Nipigon, which rises in the lake of the same name, the Annimibigon of the Indians. This vast sheet of water, which some geographers propose to include in the group of the "Great Canadian Lakes," stretches some 60 miles north and south and about 50 miles east and west with a total area of 3,000 square miles. But much of this space is occupied by several hundred islands of all sizes, in several places completely masking the real contours of the lake. Nipigon, which has an extreme depth of 540 feet, receives on its north-west side its chief affluent, the Ombabika, from a lakelet of double outflow, which also sends an emissary through the Albany to Hudson Bay.

The Nipigon emissary, that is, the Nipigon River, has a total decline of 250 feet in a course of 46 miles, during which it traverses a series of alternating lakelets and rapids with such velocity that within the last 30 years it is said to have eroded its rocky bed to a depth of 40 inches. After its junction with Lake Superior its course is, so to say, continued by Nipigon Strait, a channel flanked by basaltic walls, which like the columns of Fingal's Cave are hollowed out by the waves at their base.

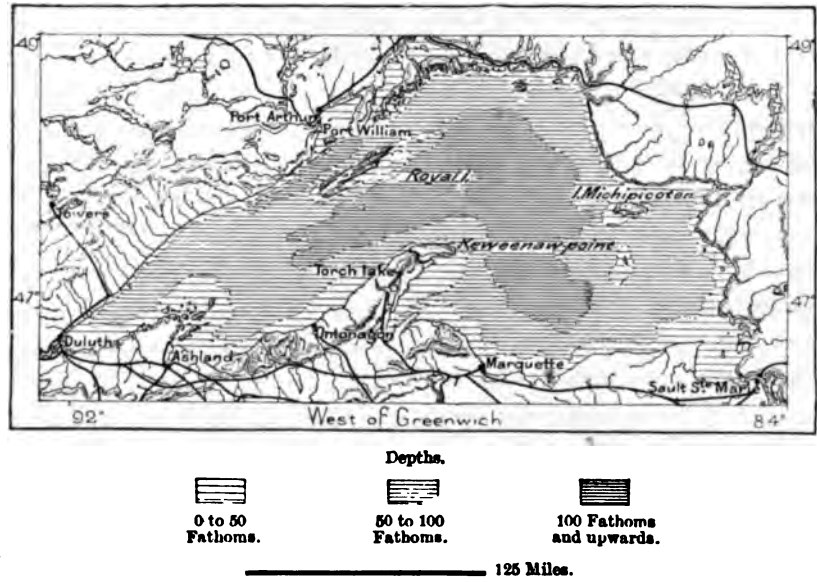
Farther east Lake Superior is joined by the Michipicoten, another large stream, which with its portages and those of the Moose River offers the shortest route between the Great Lakes and Hudson Bay.

Superior, largest and deepest of the American reservoirs, and the most extensive freshwater basin on the surface of the globe, stretches east and west a distance

of about 366 miles with an extreme breadth of 160 miles, and a total coastline of no less than 1,740 miles including all the secondary bays and inlets. The Kitchi Gami, or "Great Lake," as the surrounding Ojibways call it, has the general form of a crescent with its convex side facing northwards; but the regularity of the southern contour-line is broken by the long projecting horn of the Keweenaw peninsula.

In the central parts, the soundings generally reveal depths of 650 feet, and north of the Keweenaw peninsula Reynolds discovered a sub-lacustrine ridge, where the plummet fell rapidly from 730 to 1,150 feet, though this record is contradicted by others taken by the same explorer, and showing only 850 feet at this very spot. His chart, however, indicates 1,000 feet at a point more to the north-east. In any case the lacustrine bed falls below the surface of the

Fig. 107.—LAKE SUPERIOR.
Scale 1 : 6,500,000.



Atlantic, above which the lake stands at a mean height of not more than 630 feet.

The mud brought up from the bottom consists almost everywhere of a sticky clay, which rapidly hardens in the air, and which contains innumerable little shells. The water, fed by hundreds of torrents from the live rock, is so limpid that near the shore the sands and shingle may be seen at a depth of several yards. Little alluvial matter is brought down by the floods, and this is mostly deposited about the deltas. On the other hand, the surrounding catchment basin is relatively very narrow, so that the general lacustrine level never varies more than about three feet.

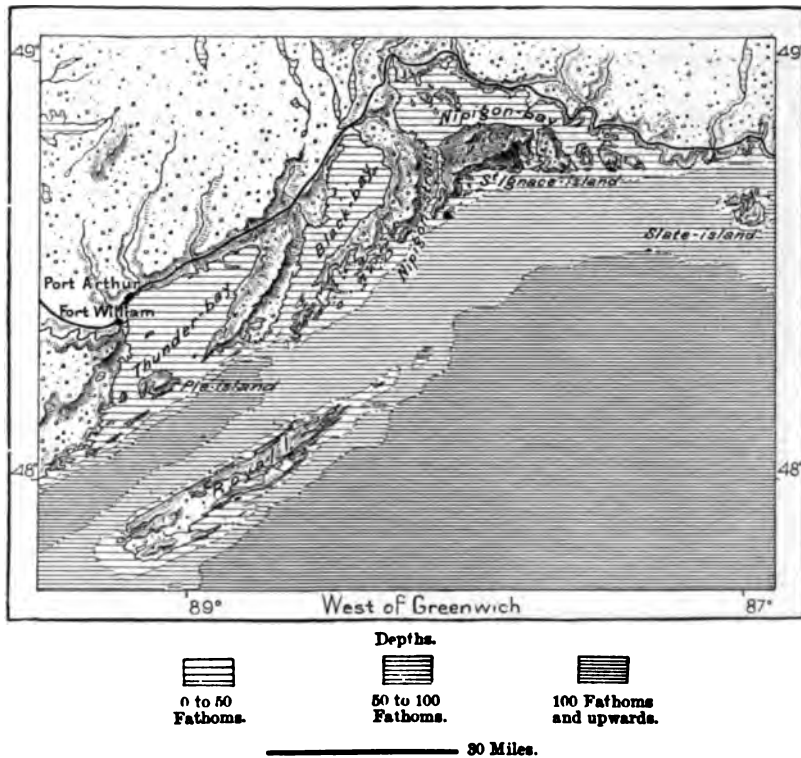
Superior is subject to the full fury of the northern, north-western, and north-eastern gales, sweeping uninterruptedly over the plains from the Polar Sea and

Hudson Bay, lashing its waters into tremendous waves, and at times strewing its surface with wreckage.

Sandy beaches occur, especially on the west side, but the basin is mostly encircled by rocky cliffs such as the eruptive masses commanding the entrance of Thunder Bay, where Pie Island rises to a height of 850 feet, and on the south side the "Pictured Rocks," variegated sandstone walls near Great Island. The central parts are entirely free from rocks, reefs, or islands, all of which occur in the vicinity of the coast. Such are St. Ignace Island, whose basalt masses rise to a height of 1,440 feet over against Nipigon Bay, and Royal Island, the largest

Fig. 108.—NORTHERN BAYS OF LAKE SUPERIOR.

Scale 1 : 200,000.



in the lake, which, although lying in Canadian waters, is included in United States territory.

This island, which extends south-west and north-east, a length of 44 with a breadth of not more than 7 miles, presents quite a unique formation. It forms a group of dolerite cliffs varying in height, but nowhere exceeding 580 feet, and all disposed side by side in narrow ridges, sharp as knife-blades, with intervening narrow glens occupied by meadows, meres, and lakes. The upper rocks are harder than the lower, so that the periphery has everywhere been eroded by the waves.

Michipicoten, another large island on the Canadian side, is also formed of

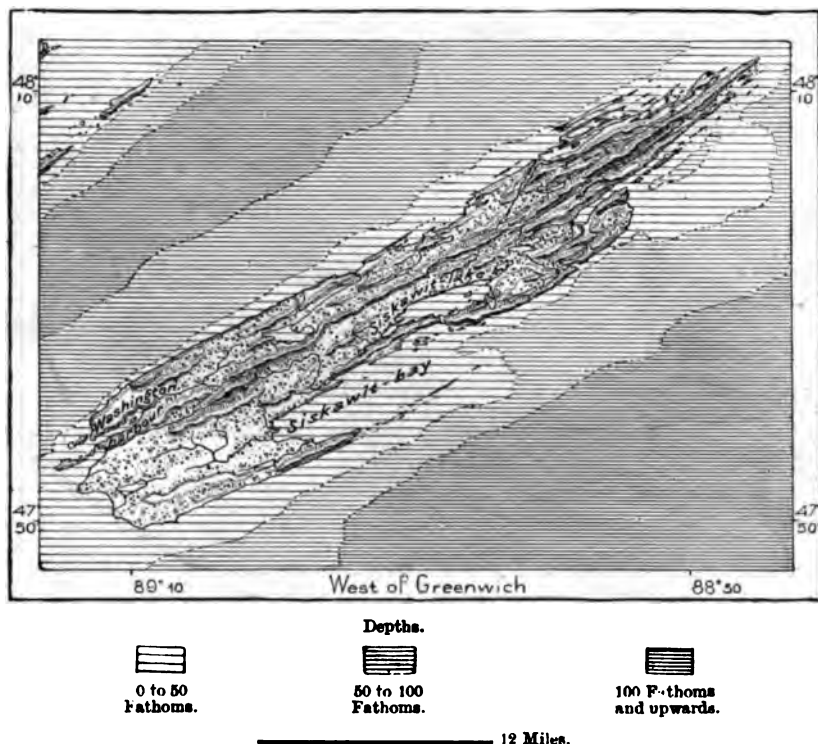
eruptive rocks over 650 feet high, but they are disposed in a regular oval mass connected by a submarine sill with the neighbouring Caribou Island, noted for its rich copper mines.

LAKES HURON AND ERIE.

In Whitefish Bay, at the south-east angle of the lake, the overflow is discharged through the winding channel of the St. Mary, which emissary varies from about half a mile to over a mile in width. Between its low sandstone banks, the current is obstructed by a rocky ledge, forming the famous "sault," 16 to 18 feet high, which was discovered in 1641 by the missionaries Raymbault and

Fig. 109.—ROYAL ISLAND.

Scale 1 : 650,000.



Jogues, and which for many years arrested the navigation between the lower lakes and Superior. But for over half a century this obstacle has been turned, and riverain craft can now ascend from Belle Isle to the St. Louis River, a total distance of 2,100 miles from the Atlantic.

Below the rapids the St. Mary River is divided into two branches, each of which again ramifies into numerous channels winding between a chain of low willow-grown islands. The southern branch falls directly into Lake Huron, while the northern is continued by the North Channel along the Canadian shore to Georgian Bay, the great north-eastern inlet of Lake Huron. The regular line of insular land between these two basins includes the Great Manitoulin Island, the

largest in the whole basin of the Canadian Mediterranean. This sacred land, abode of the "Supreme Manitu," consists mainly of silurian limestones scored with deep fissures, and pierced by grottos. Murray attributes to underground currents the phenomenon here presented by Lake Manitu-Waning, which, though fed only by a little surface rivulet, nevertheless gives rise to a very copious emissary. The Cockburn and Drummond islands lying farther west are also known by the names of Middle and West Manitoulin.

Georgian Bay is sufficiently distinct from Huron to be regarded as a separate basin. It communicates with the main reservoir only through the winding passages of North Channel, and by the island-studded straits flowing between Great Manitoulin and Saugeen, or Indian Peninsula. It also contrasts with Huron in the greater irregularity of its shores, which are carved into deep inlets and even fjords penetrating far inland between steep rocky walls. In the central parts, it is very deep, and even near Cabot Head, the promontory of Indian Peninsula, a trough has been discovered over 500 feet deep.

Of all the great Canadian basins Georgian Bay receives the greatest relative supply of water. The two large lakes Nipissing and Tamagaming, besides numerous smaller reservoirs, send it their overflow through French River, one of the most romantic streams in Canada. Tamagaming is one of the few basins which have a double outlet, one through the Montreal emissary to the Ottawa, the other to Lake Nipissing, a deep reservoir where Morin has recorded soundings of 630 feet. Nipissing itself is also said to have two emissaries, one through the French River to Georgian Bay, the other underground to the Mattawan tributary of the Ottawa. But however this be, the French River alone represents a very copious outflow, estimated at over 9,000 cubic feet per second.

Other large feeders of Georgian Bay are the Maganetawan and the Severn, which carries off the overflow of the large Lake Simcoe and of several other smaller basins in the province of Ontario.

Huron, which Champlain called the "Freshwater Sea," is about half the size of Superior, which it resembles in its general outline, only that it is disposed not east and west, but north and south. With the vast Lake Michigan, which lies entirely within the United States, it forms an enormous semicircle fringed by the already described silurian escarpments. The middle of this semicircle is filled by the Michigan Peninsula, the exact centre of which is occupied by a carboniferous basin. All the surrounding hills bear traces in their terraced beaches of the vast inland sea which at one time covered all the peninsulas at present intervening between the Great Lakes.

According to a legend probably of Indian origin, Huron is the deepest of all the Laurentian lakes, and a sounding-line 1800 feet long is said to have failed to touch the bottom near the entrance of Saginaw Bay on the west side. Nevertheless, the carefully executed soundings of the American marine indicate an average depth of not more than 160 feet in this region. The deepest trough lies about midway between Thunder Bay and the entrance to Georgian Bay, which is 700 feet deep. The bed rises gradually towards the shores, but offers only a very few

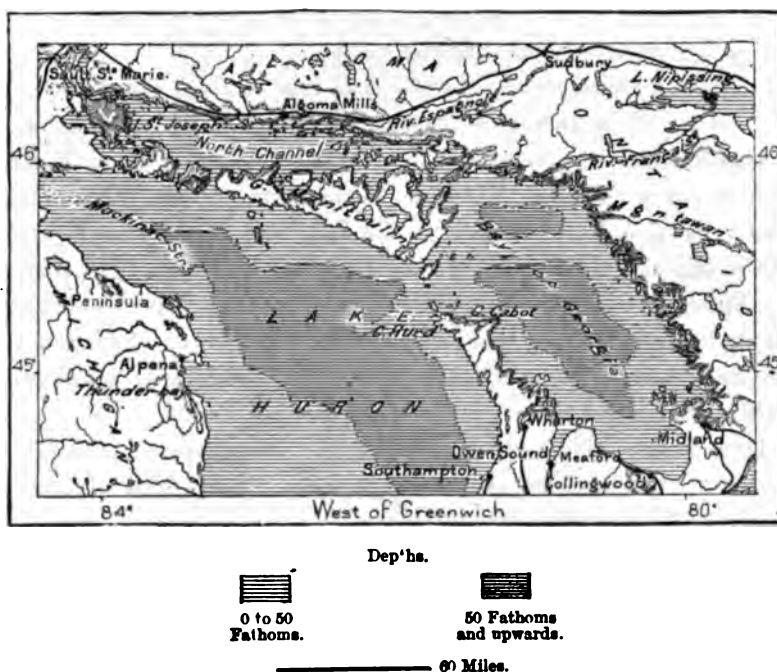
available anchoring-grounds. To this cause, combined with its more northerly position beyond the main line of railway from New York and New England, is due the absence of large ports, such as those that have sprung up on Lakes Michigan, Erie, and Ontario.

The Michillimackinac, or Mackinaw Strait, through which Huron communicates with Michigan, stands like Georgian Bay at the same level as the basins themselves. Consequently all three form a single sheet of water at the common elevation of 595 feet above the Atlantic.

Lake Simcoe, the Wentaron of the Indians, and "Lac des Claies" of the French Canadians, now communicates with Georgian Bay only through a

Fig. 110.—LAKE HURON AND GEORGIA BAY.

Scale 1 : 5,000,000.



fluvial channel, but it represents a broad strait by which Huron was formerly connected with Lake Ontario, thus converting into an island the present thickly-peopled peninsular region of the province of Ontario.

At the southern extremity of Huron the sandy bed gradually rises to within 23 feet of the surface, thus forming a bar at the head of the St. Clair (Sainte Claire) emissary. This river, which is accessible to large vessels, winds along in a tranquil stream broken by no rapids, and at an average incline of a little over half an inch in the mile, but about the middle of its course it ramifies amid shallows, where a navigable canal has had to be constructed. After traversing Lake St. Clair, it takes the name of Detroit, and a few miles below the city of that name falls into the west end of Lake Erie. Its mean discharge, which varies

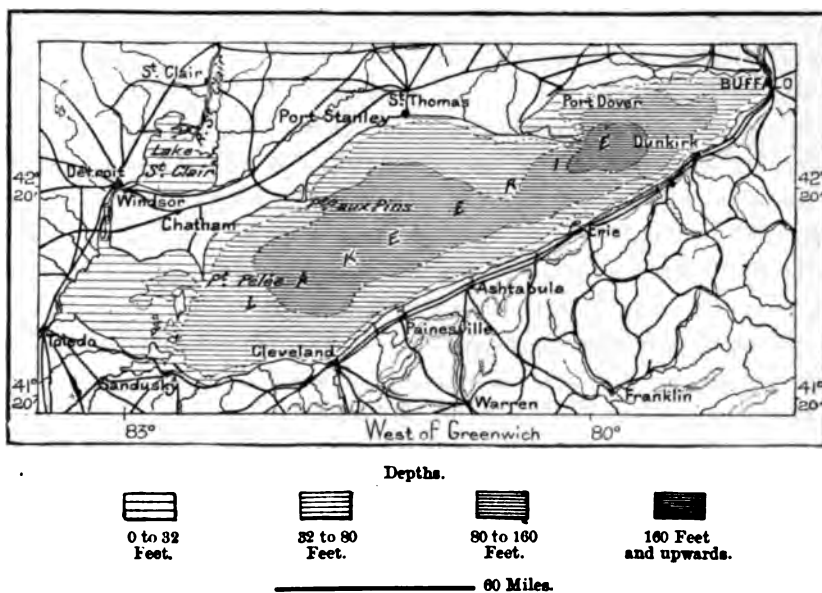
little throughout the year, is estimated at about 250,000 cubic feet per second. But this estimate seems too low when compared with the volume of the Niagara River, which should be about the same as that of the St. Clair slightly increased by the few insignificant affluents of Lake Erie.

The chief tributary of the Detroit is the Thames, which traverses the most thickly-inhabited and best-cultivated district in Ontario.

Lake Erie, that is, "Cherry Lake," is the southernmost of the great Canadian basins. It is crossed by the forty-second parallel, and consequently lies under about the same latitude as the Adriatic and the Gulf of Lions. It is also disposed south-west and north-east nearly in a line with the axis of the lower valley of the St. Lawrence, while its somewhat regular oval form shows that it has reached the transitional stage between a lacustrine basin and a fluvial channel. Even in its

Fig. 111.—LAKE ERIE.

Scale 1 : 4,000,000.



comparative shallowness, averaging only 50 feet with an extreme depth of 200 off Long Point on the east side, it approaches more to the character of a river.

Of all the great basins Erie alone has its bed at a higher elevation than the level of the Atlantic. The whole reservoir forms three successive terraces: the western, 25 to 40 feet deep, the central, 60 to 80, and the eastern, where occur the greatest depths. The western constitutes an almost independent basin separated from the rest by the long promontory of Point Pelé, continued southwards by the island of the same name and another sandbank. In some places the bed is composed of sand and clay, but more generally of mud formed by the disintegration of the surrounding limestone cliffs. The navigation is much endangered both by sandbanks and shallows along the shelving beach, and in winter by the ice, especially in the southern parts, which remain frozen longer than elsewhere.

NIAGARA RIVER AND FALLS.

At its north-east extremity Erie sends its overflow to Ontario through the famous Niagara River of the Iroquois, a name of which various forms and meanings are given by etymologists.* The river is only about 36 miles long, but the difference of level between the two lakes is no less than 330 feet, and at one plunge about half of this difference, say 150 feet, is cleared. The silurian escarpment which encircles Lakes Michigan and Huron, and which also skirted Lake Erie before its partial exhaustion, is here broken by the force of the waters. But this is a comparatively recent event in the geographical history of the globe, and the river has only had time to transform its falls to rapids for about half of its original "high level" course. Hence it still flows tranquilly from Erie to the stupendous cataracts, and thence tumultuously towards Ontario, the cataracts lying almost midway between the upper and lower reservoir. But the early documents assign a far greater elevation to the falls, Joliet amongst others asserting that "Lake Erie falls into Lake Frontenac (Ontario) by a fall of 120 toises," † while Hennepin estimates the plunge at "600 feet."

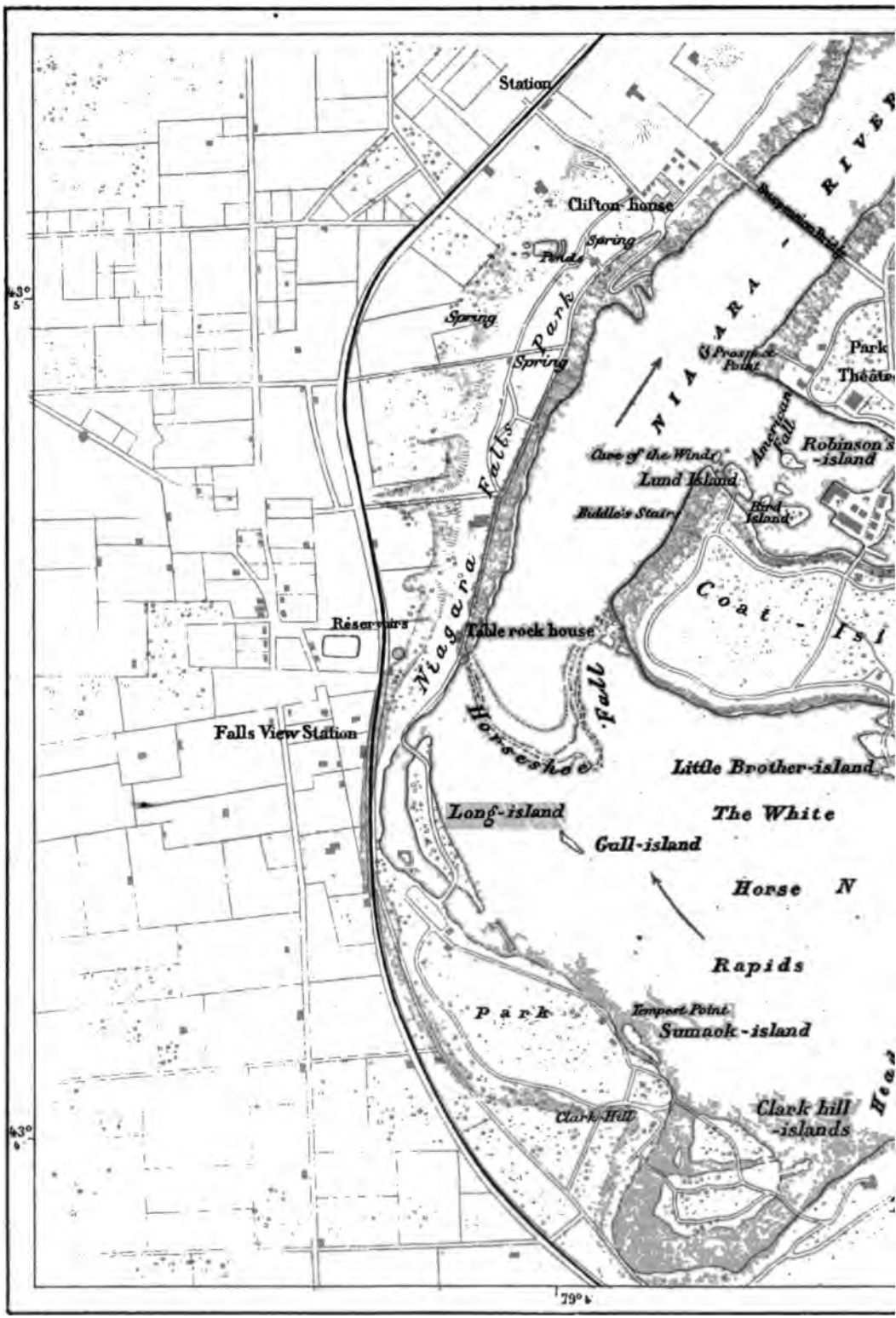
At its outlet close to Buffalo, the emissary, here about 650 feet broad, flows at first in a placid current northwards, and then ramifies into two broad branches encircling Grand Island. Below this island, which is 12 miles long, the reunited stream resembles a lake, expanding to about two miles between its low-lying banks. So far it has fallen only 20 feet, flowing at an average depth of 25 to 30 feet. But at the confluence of the Chippewa, on its left bank, the incline becomes more decided, and the current grows more and more rapid between its converging banks. First are developed long sinuous undulations, then chopping white-crested waves, as the stream is parted into two branches, which sweep in tremendous rapids, and with irresistible velocity, round both sides of the densely wooded Goat Island. On the right, the smaller branch, contracted to a breadth of less than 500 feet, rushes wildly amid the projecting rocks and ledges along the American side; on the left, the main branch, comprising over four-fifths of the whole volume, fills a semicircular amphitheatre over a mile in all directions, where the liquid masses expand into a vast chaos of angry waters. Viewed from the southern point of Goat Island, the two inclined streams, whose foaming crests shut out all perspective higher up, seem to descend from "the windows of heaven." The observer is overwhelmed with awe at the sight of these prodigious floods, apparently rushing headlong from the near horizon, and lower down suddenly vanishing out of sight.

The "American" and "Canadian" Falls, as they are respectively called, are parted by the northern bluff of Goat Island facing the chasm, one plunging in a relatively thin sheet slightly concave towards the centre, the other developing the vast semicircle of the "Horseshoe Falls," a name, however, which is scarcely any

* Such are Niakaré, "Great Noise;" Oniahgarah, "Thunder of Waters;" Onyahrah, "Passage between two lakes;" Onghiahrah, name of an ancient riverain tribe.—(*Picturesque Canada.*)

† The old French *toise* answered to the English fathom, being equivalent to 6 French, or 6.396 English feet.

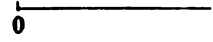
NIAGARA



LINES OF

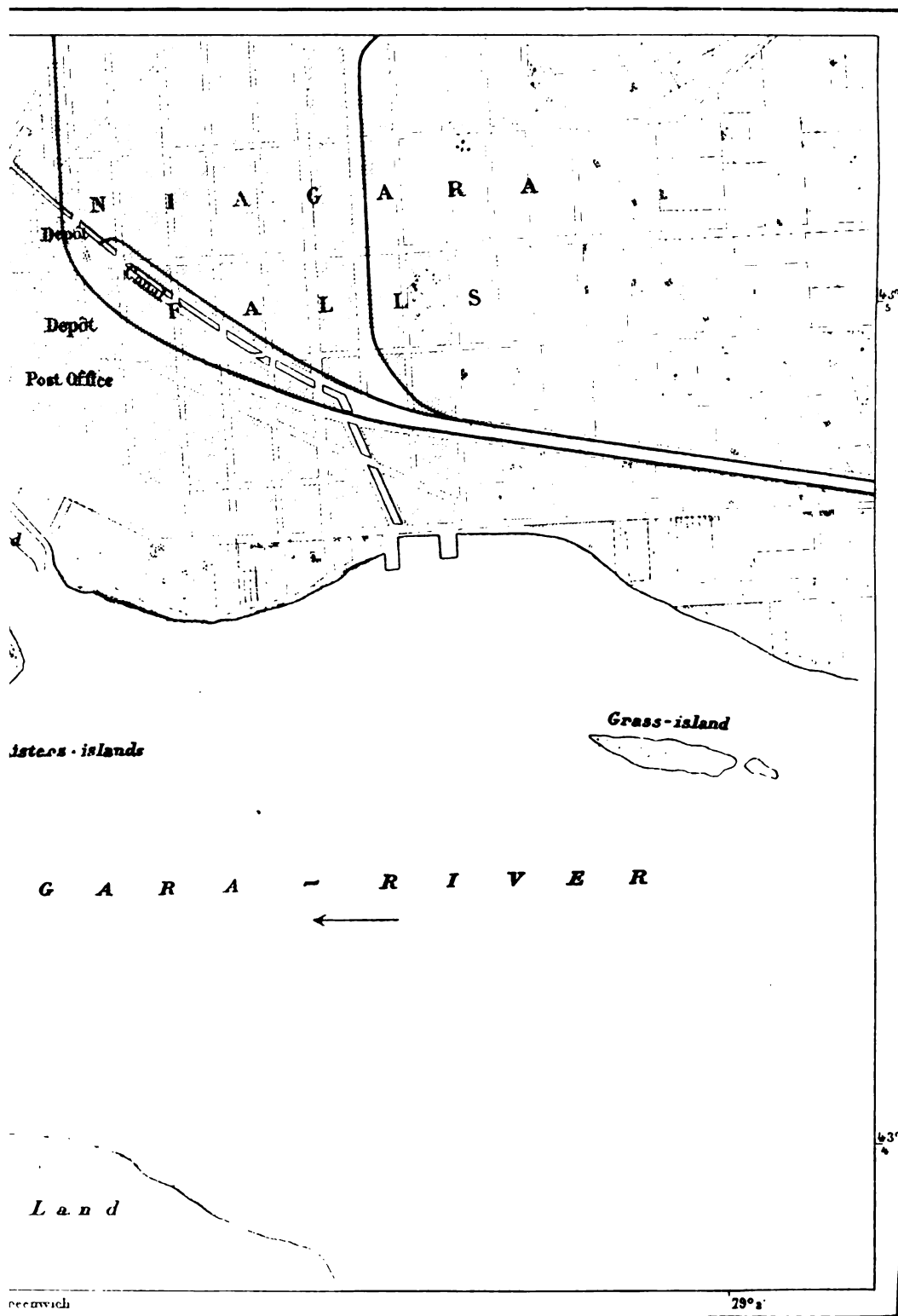
1845

1875



NEW YORK

FALLS.



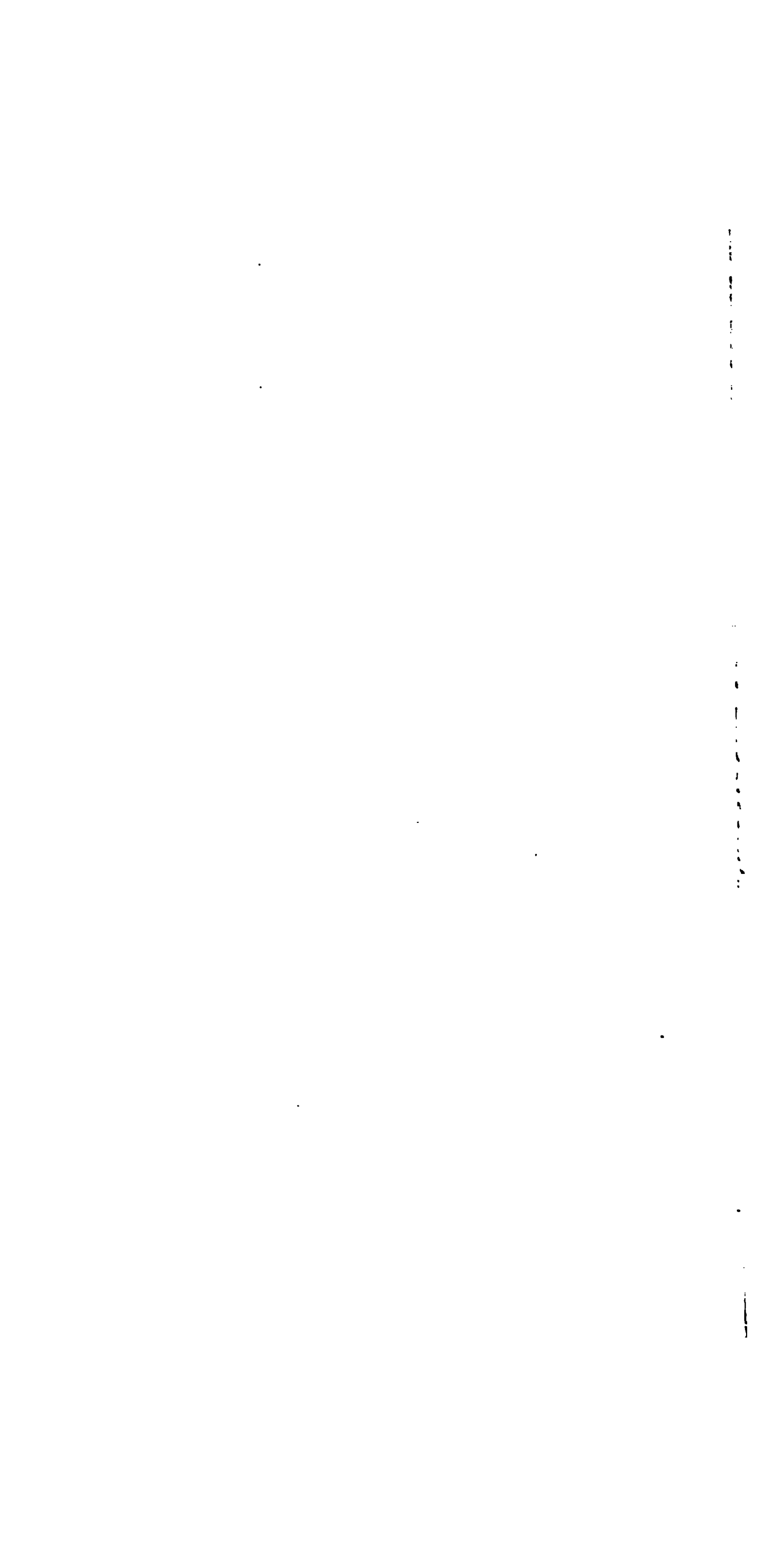
THE CANADIAN FALL.

1886

1889

1100 Yards.





longer justified. Like so many other Canadian cascades, it forms rather a "chaudière," or "cauldron," where the sheets of whitish and emerald green water descend on three sides into a common basin, and where they disappear for a moment in a dense mass of ascending vapours. Thus to the downward rush corresponds an upward movement, caused by the recoil of a great river suddenly precipitated into a deep chasm, where its waters are torn by a hundred hidden reefs and dissolved into clouds of mist, which continually roll up and are re-condensed in the higher atmospheric strata, again descending on the surrounding heights in the form of rain, where the sun describes an ever-shifting rainbow.

At times, the thunder of the waters is wafted to a considerable distance on the breeze; but as a rule the visitor is surprised by the apparent stillness, and even in the immediate vicinity of the Falls misses the deafening roar supposed to be heard far and wide. Nor does the Niagara any longer roll down its tumultuous waters in the vast solitude of the primeval forests, as at the time when it was first visited by Europeans. The noisy life of towns and factories, the whistle of the locomotive and rush of trains blend with the roar of the waters and often drown their voice.

At one point on the American side the view is somewhat marred by industrial structures of a mean type. Nevertheless, both banks close to the falls, together with Goat Island, have become national properties, and the stupendous spectacle may now be freely contemplated from shady avenues, artificial platforms, and other convenient points. On the Canadian side, the railway train, emerging on a pleasant forest glade close to the scene, obligingly waits while the traveller enjoys a hasty glimpse of the marvellous sheet of liquid green curving over the rocky ledge; a few minutes later he is hurried away, his mind filled with a vision as of some supernatural world.

The actual volume of water precipitated by both falls has been diversely estimated; yet the discharge varies little, except in winter when the river banks are frozen, when crystal pendants are attached to every projecting ledge, the aqueous vapours massed in cones along the margins, and the living falls pent in right and left by congealed crystalline cascades. At times, the huge blocks of ice drifting with the current have collected in an enormous pack beneath the falls, forming a temporary bridge right across the stream, from which the spectacle could be surveyed from below.

Even in summer the changes of volume are caused less by the greater or less abundance of rain, than by the direction and force of the winds, which drive the Erie waters now to one, now to another quarter, thus producing a difference of three or four feet in the level of the current at the outlet. At this season the mean discharge has been estimated at about 350,000 cubic feet per second, or, say, twenty times the volume of the Seine at Paris.* The force of the falls has also been approximately estimated at from five to seven millions of horse-power, and some fanatical engineers, deploring this annual loss of some £40,000,000, have expressed the hope that the whole of the power now running waste may some day

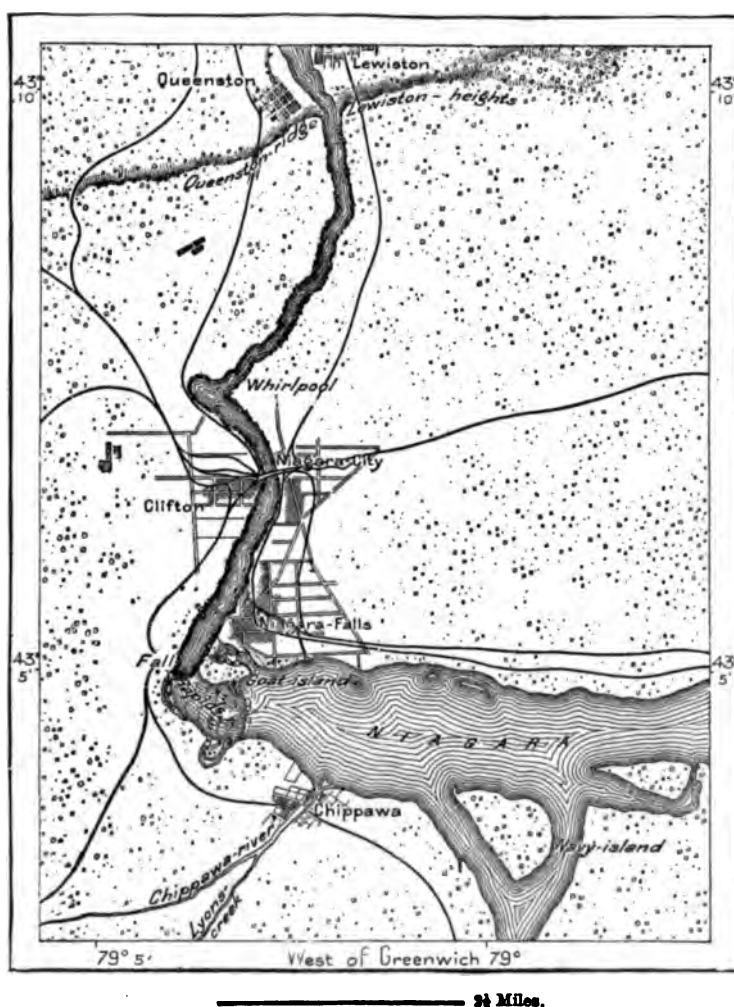
* Barrett, 325,000; Clarke, 385,000; but the United States Census of 1880 only 165,000 (f).

be turned to account in the American factories. A canal, or mill-race, constructed on the right bank, already supplies driving power to numerous workshops disfiguring the landscape, and it has been proposed to utilise the Canadian Falls for the production of electricity.

Since the first drawings made by Hennepin in 1678, considerable changes

Fig. 112.—NIAGARA FALLS AND RAPIDS.

Scale 1 : 120,000.



have taken place in the general aspect of the falls, which, owing to the erosion of the rocks, are retreating towards Lake Erie. This erosive action of the stream is aided by the disposition of the strata, which consist of calcareous rocks resting on somewhat loose marls or overlying friable sandstones. The lower strata are thus eaten away by the underwash until the overhanging ledges at last give way, yielding to their own weight and the force of the current.

According to Bakewell, the retrograde movement has proceeded since the close

of the last century at the mean annual rate of about 40 inches; but more accurate measurements have shown that between 1842 and 1883, the total erosion of the Canadian fall has been 250 feet, or about six feet a year, and of the American not more than 38 or 40 feet during the same period of 42 years. Assuming that the rate has always been much the same, a period of about 6,000 years must have elapsed since the work of erosion was begun at the cliffs where now stand the towns of Queenstown and Lewiston. Should this movement continue, the American fall must disappear in the course of the next thousand years. By its more rapid recession, the Canadian fall will attract all the waters to itself, and Goat Island will thus form part of the mainland. At the same rate of progress the falls must disappear altogether in about 20,000 years.

Below the cataracts, the Niagara River sweeps at an average depth of over 160 feet, and forms a continuous rapid between two vertical cliffs 200 feet high, and beneath a suspension bridge and a railway viaduct, down to the circular basin of the "Whirlpool," where the current develops a twofold eddy, one from bank to bank, the other from the surface downwards. Thus the waters may be seen apparently plunging into deep chasms and reappearing lower down in seething undulations rising three or four feet above the normal level. Farther on follow other vortices, rapids, and whirlpools, still between steep rocky banks, completely concealing the fluvial gorge from the neighbouring plains, which are gently undulated and highly cultivated. At last the cliffs fall on both sides, and the Niagara winds in a majestic stream away to Lake Ontario.

LAKE ONTARIO AND THE ST. LAWRENCE.

This basin, last of the great lacustrine depressions, preserves under a somewhat modified form the name of "Lovely Lake," given to it by its Iroquois inhabitants. This etymology, however, proposed by the missionary Hennepin, is doubtful, and according to Champlain, the lake was named from a neighbouring tribe.* Although smaller than Erie, Ontario has a larger volume, its depth exceeding 660 feet, and according to Schermerhorn, reaching 740 feet in its deepest cavity.

The shores of Ontario show more clearly than those of the other basins how much larger these lakes were formerly than at present. An old beach following the present shore-line at a varying distance of from six to twelve miles, and at a

* Nomenclature of the great lakes at various periods:—

Superior: Kitch Gami, or "Great Lake" in Ojibway; Great Lake of the Naduessius; Lake Tracy (Marquette); Lake Condé.

Michigan: Michin Gami; Missihi-Ganin; Mitchi-Ganong; Lake Dauphin (Membré, Le Clercq, La Potherie); Lake of the Illinois (Marquette); Lake of the Algonquins; Lake St. Joseph (Allouez).

Huron: Karegnondi; Mer Douce des Hurons (Champlain, Gallinée); Lake of the Hurons; Lake of Orleans.

St. Clair: Sainte-Claire; Lac des Eaux Salées; Lac des Claies; Lac de la Chaudière.

Erie: Herrie; Teiocha-Rontiong; Lac de Conty; Cat Lake.

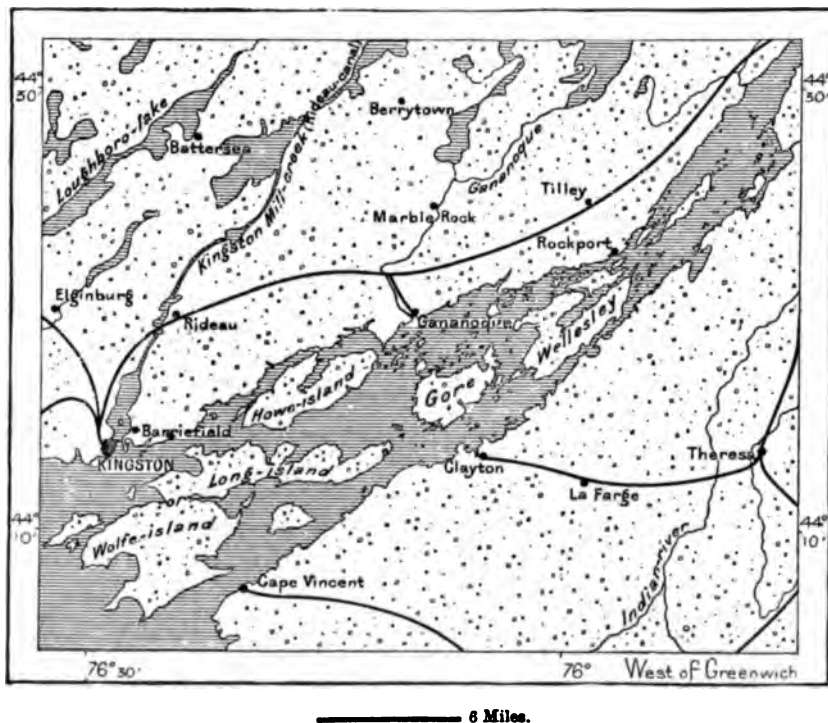
Ontario: Kanandario; Staniadorio; Lac des Outouoronnons (Champlain); Lac des Iroquois; Cataraqui; Lac Saint-Louis; Lac Frontenac. (Winsor, *America*; Garneau; Sulte, &c.)

height of from 150 to 200 feet above the lacustrine level, so obviously represents an older margin, that it has been named the "Lake Ridge." This ridge, itself a prolongation of the Niagara cliff, is interrupted at intervals by the channels of the Genessee, Oswego, and other streams rushing over falls and rapids from basins which, like Ontario, have been gradually contracted in size. One of these channels represents a strait through which Ontario formerly sent its overflow to the Atlantic through the Mohawk and Hudson valleys.*

Like that of Erie, the elongated and regular form of Ontario shows that it has entered the period of transition between a lacustrine and a fluvial basin. Its south side runs nearly in a straight line without any indentation, and for more than half

Fig. 113.—THOUSAND ISLANDS.

Scale 1 : 520,000.



their length the opposite shores are equally uniform. They are everywhere pleasantly wooded, at least where the woodman's axe has not already been at work.

Thanks to its depth, Ontario freezes to a much less extent than Erie; but like it and the other great lakes, it is subject to sudden *seiches*, or oscillations, caused by changes of atmospheric pressure, and usually forerunners of storms. But no appreciable tides have yet been noticed, like the regular ebb and flow recorded by Graham in Lake Michigan. But no systematic study has yet been made of the various lacustrine phenomena, such as colour of the water, currents, *seiches*,

* Schaler; Winsor's *America*, vol. iv.; J. K. Gilbert, *Forum*, May, 1889.

eddies, penetration of light, glaciation, temperature at the surface and lower down, differences of fauna, and the like.*

The two coldest basins are Superior and Georgian Bay, where the temperature in the lower depths varies from 33° to 39° F., the mean of the other lakes being nearly 20 degrees higher. In 1843 Superior was completely frozen over.

Towards its eastern extremity, Ontario loses its regular contours, and here the ramifying peninsula of Quinté, projecting from the Canadian side, encloses numerous inlets, winding channels, and wooded islands. Then follows, towards the outlet, a perfect labyrinth of islets of all sizes and forms, thickly studding the head of the St. Lawrence, and collectively known as the "Thousand Islands," though really numbering nearly two thousand, and even more if all the eyots, reefs, and rocks be included which are flooded or exposed with the rise and fall of the waters. Some are large enough to be covered with dense forest or grassy slopes; others are mere patches of verdure, or shaded perhaps by a solitary wide-branching tree. Some of the fluvial channels are so narrow that the palatial steamers glide smoothly along amid avenues of rich vegetation, varied with sunny glades, smiling gardens, or a tangle of matted foliage almost interlacing overhead. Then the leafy waterway suddenly broadens to the proportion of a land-locked lake still fringed with green slopes, where all outlets are masked by the tall forest growths clothing the converging rocky heights.

These rocky heights, throughout the archipelago, are of silurian formation, the "Thousand Islands" evidently forming an eastward continuation of the "Thousand Headlands" of Quinté and the adjacent coast. One of these islands, strewn with picturesque boulders and overgrown with magnificent timber, has been reserved for the Canadian public as a national park for ever. Others, bought by wealthy American citizens, have been converted to delightful pleasaunces and summer retreats; for within the broad bounds of the Dominion, there are no lovelier land and water scapes than those of this marvellous fluvial archipelago.

Below the Thousand Islands, the St. Lawrence flows as a fully developed river north-eastwards, receiving on its right bank numerous affluents from the Adirondack uplands in the State of New York. At intervals it expands into spacious basins resembling lakes, and even bearing that name, as, for instance, the St. Regis and St. Francis Lakes. But elsewhere the river contracts its walls, and develops long lines of rapids such as La Plate, Les Galops, Le Long Sault, the Cedars, the Cascades, and so on. But the skilled Canadian boatmen are accustomed to shoot these inclines, one of which, the Long Sault, is nearly ten miles

* Table of the Laurentian lakes of over 500 square miles in extent:—

	Height in feet above sea-level.	Area in sq. miles.	Depth in feet.		Height of bed above or below sea-level (feet)	Volume in millions of cubic feet.
			Extreme.	Mean.		
Nipigon . . .	840	3,000	540	330	—265	26,000·5
Superior . . .	627	31,400	1,000	700	—400	629,395·0
Michigan . . .	595	25,600	870	400	—280	262,500·0
Huron	"	18,000	690	330	—110	159,000·0
Georgian Bay . .	"	5,000	330	190	—252	26,640·0
Erie	564	10,000	530	390	+365	17,750·0
Ontario	235	7,300	740	290	+500	63,365·0

(Reynolds, Macomb, Engelhardt, Schermerhorn, &c.)

long, and the up-stream navigation is kept open by a regular system of canalisation.

Below St. Francis Lake the St. Lawrence is joined on the left bank by its largest tributary, the Ottawa, the "rivière des Outaouais" of the early French chroniclers. This romantic stream, longer than the Rhine, more copious than the Nile, is already a considerable watercourse where it enters the Temiscaming ("Deep Water") basin below the "hauteur des terres."* But its upper course is entirely obstructed by a series of no less than fifteen cataracts, whence this section takes the name of the "rivière des Quinze" ("River of the Fifteen," that is, Portages). Towards the north its headstreams intermingle their waters with those of Lake Abittibe, which belongs to the Hudson Bay slope, sending most of its overflow through a large emissary to the Moose River.

At the outlet of Abittibe, the Ottawa receives through a superb cascade 115 feet high the contributions of the still larger Kippewa (Kipeewa) basin, whose wooded shores stretch away to the south-east in an endless labyrinth of channels, straits, creeks, inlets branching off in every imaginable direction. Even in Canada there are few watercourses more diversified than the Ottawa, whose main channel offers a continuous succession of contrasts. Here a cascade, there a rapid, farther on a meeting of many waters which again break into divergent streams; then a narrow fluvial gorge flanked by jagged rocky walls, followed by a long chain of narrow lakes, and here and there even broad basins, whose bays stretch away beyond the horizon. Such is the infinitely varied character of the romantic stream which forms the political boundary between the provinces of Ontario and Quebec.

The same aspect is presented by its affluents, especially those flowing through Ontario to its right bank. Such are the Mattawan, the Bonne Chère, the Madawaska, even a "Mississippi," and lower down the Rideau with a canal through which Ottawa, capital of the Dominion, communicates directly with Lake Ontario. From the Quebec side come the copious rivers Moine, Noire, Coulonge and Gatineau, the last mentioned rising in the same district of the "height of land" as the Ottawa itself, which it joins, after a course of 370 miles, opposite the Canadian capital. Farther east come three other large streams, the Lièvre, Rouge and Nord, all from the same waterparting.

Before reaching the St. Lawrence the Ottawa resumes the aspect of an elongated lake, that of the Two Mountains, which sends one ramifying branch north-eastwards to the Montreal archipelago, while the main current sweeps in two streams round the wooded island of Perrot to its confluence with the St. Lawrence. Its volume appears to be greater than that of the Rhine or the Rhone, being estimated at the Carillon falls opposite Grenville, and below all its large tributaries, at 84,000 cubic feet per second.†

Even after its junction with this great tributary, the St. Lawrence continues

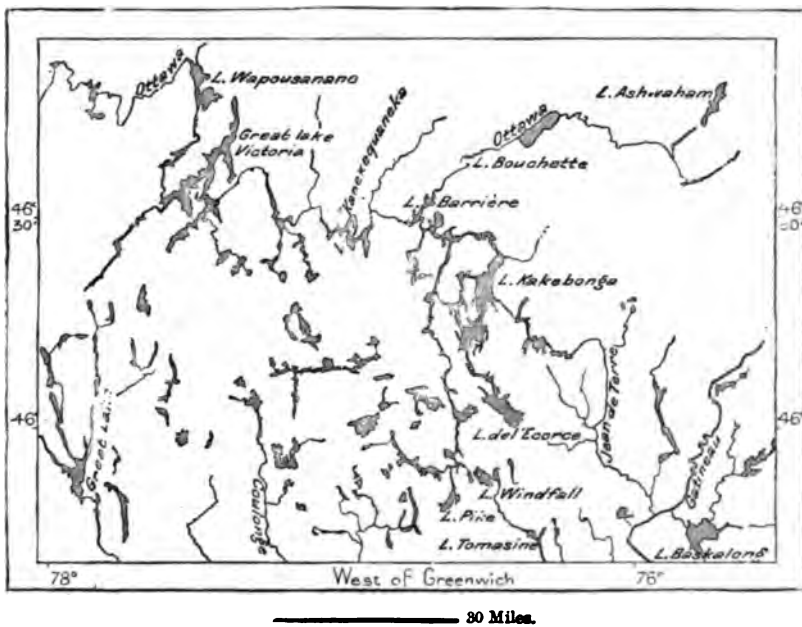
* Literally "the height of land," the familiar French-Canadian expression for any parting line between two water systems. The watershed here intended is the divide between the St. Lawrence and Hudson Bay basins.

† Flood waters, 150,000; low water, 35,000; mean, 84,000 (T. C. Clarke, *Report of the Ottawa Survey*).

to develop numerous rapids, the last and finest of which is that of Lachine, which, despite its formidable aspect, has never been the scene of any disaster. Up to this point the mainstream is accessible to large vessels throughout the year, although at several points the current is still very swift. Formerly the lower reaches were too shallow for ships of heavy draught, Lake St. Peter, midway between Montreal and Quebec, having scarcely more than 14 or 16 feet at the "pass." The alluvial matter, which has already changed the whole of the upper course into grassy plains or swamps, has gradually raised the bed of the river lower down; but by dint of constant dredging a channel is kept open twice as

Fig. 114.—INTERMINGLED SOURCES OF THE OTTAWA AND GATINEAU.

Scale 1 : 2,000,000.



deep as that formed by the river. The marine tides cease to be felt 90 miles below Quebec.

Above Lake St. Peter the St. Lawrence is joined by the Richelieu or Sorel, "half lake, half river," which rises in Lake George, New York State, and traverses the much larger basin of Lake Champlain, whose northern inlets penetrate across the frontier into Canadian territory. Here the Richelieu assumes the aspect of a river, and after forming a few rapids expands at Chambly into a broad basin, which marks the limit of steam navigation.

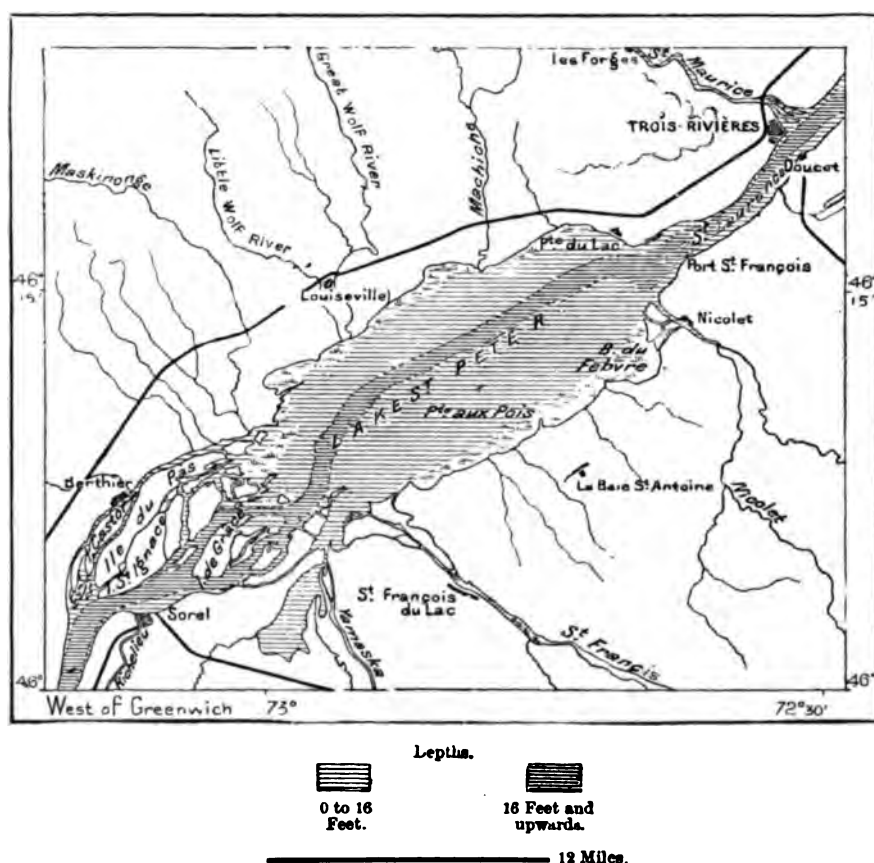
A study of the low peninsula at the confluence just above Lake St. Peter seems to show that here the Richelieu occupies the channel through which the St. Lawrence formerly flowed. Before piercing the rocky barrier which arrested its course at Montreal, the main stream was deflected southwards across the present marshy tract of Laprairie to the Chambly basin, where it flooded the valley at present traversed by the Richelieu. The general level exceeds only by a few

yards that of both streams, while the Montreal and Chambly basins themselves stand at about the same height above Lake St. Peter, 13 and 12 feet respectively. During the floods the St. Lawrence even now sends some of its overflow to Lake Chambly. Below the Richelieu Lake St. Peter receives on the same side the Yamaska, and lower down the St. Francis, the emissary of the deep Lake Memphremagog.

Next to the Ottawa the largest affluent of the St. Lawrence, at least within its

Fig. 115.—LAKE ST. PETER.

Scale 1 : 550,000.



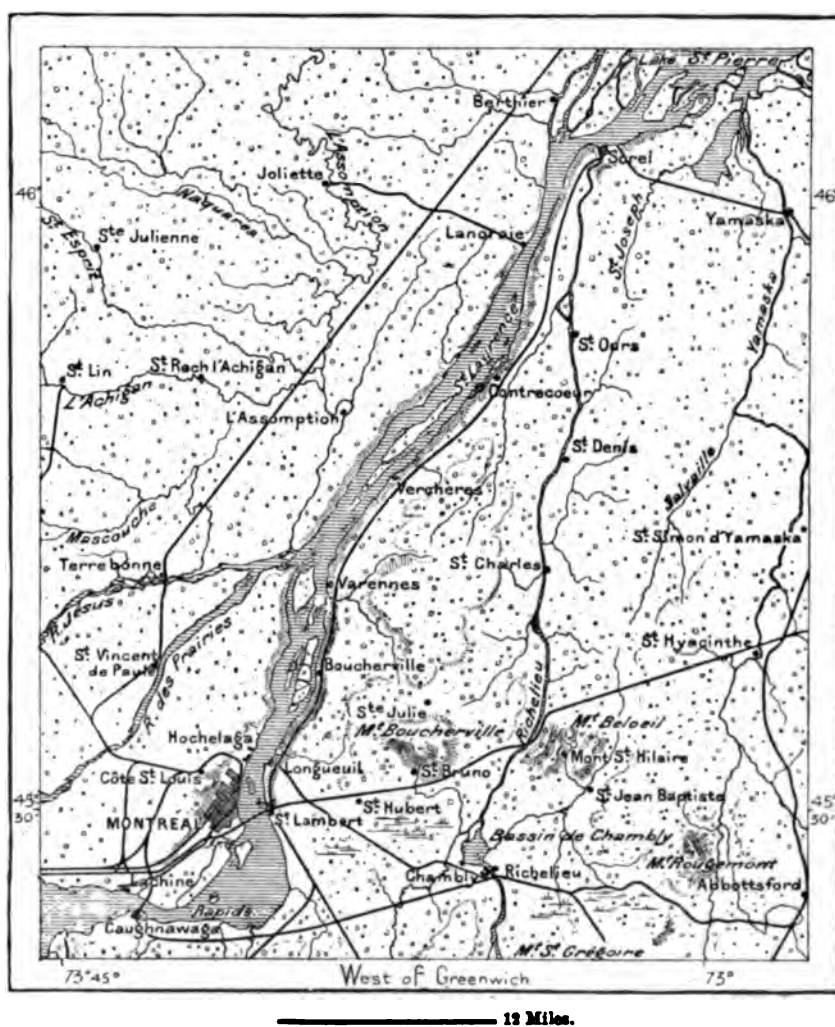
strictly fluvial course, is the St. Maurice, which rises in the Height of Land, where it intermingles its headstreams with those of the Gatineau. It springs from lakes and receives the contributions of lakes on both sides, so that it is already larger than the Loire or the Garonne before rushing over the edge of the syenite plateau to enter the Laurentian plains. Although only one in a thousand falls, all remarkable for their volume and picturesque beauty, the Chaounigan cascade presents special features, distinguishing it amongst so many marvels. Above the falls the mainstream ramifies into two great branches and several secondary channels winding amid a cluster of wooded islets. From a bluff rising above the very centre of the chasm the currents are seen converging from all

points and tumbling in wild disorder into the "Devil's Whirlpool," a vast cirque where the tumultuous waters are churned up and dashed against the encircling cliffs. Then the stream is suddenly pent up in a gulley scarcely 100 feet wide, where the whole body of water is engulfed beneath an overhanging rocky wall.

Immediately below, the thundering cataract again expands into a broad basin,

Fig. 116.—ST. LAWRENCE AND RICHELIEU RIVERS.

Scale 1 : 700,000.



while the dunes and sandy tracts of the lower course recall the time when the whole region was flooded by a vast lake. Between the various cataracts obstructing its upper course, the St. Maurice is navigable by steamers for a total distance of 200 miles.

THE ESTUARY AND GULF OF ST. LAWRENCE.

Soon after passing the Quebec narrows and branching round the large island of Orleans the St. Lawrence loses the aspect of a river and enters its great estuary.

Here the banks diverge uniformly, as they approach the Gulf of St. Lawrence, where the Laurentian waters are lost in the broad Atlantic. Below Quebec, where the tides rise 16 or 17 feet, the transformation of the fluvial channel to a marine inlet is effected very gradually. The ebb and flow, less and less affected by the upper currents, become continually more uniform; the water, while fresh at Cape Diamond, increases steadily in salinity; schools of porpoises and other cetaceans begin to make their appearance, while marine fishes and mollusks penetrate far up the channel. The volume of water also increases enormously, the tidal currents between the Labrador and Gaspé coasts being a hundredfold greater than the discharge at Quebec, which according to the lowest estimates amounts to 430,000 cubic feet per second.

About 120 miles below Quebec the estuary receives the waters of the Saguenay, itself resembling a fjord far more than a river, at least in its lower course. Its farthest headstreams rise 250 miles in a straight line from the banks of the St. Lawrence, at an altitude of 1,400 or 1,600 feet above the sea in a still imperfectly explored district of the Height of Land. One of the chief branches, whose impetuous cataracts were ascended during the last century by the botanist, Michaux, bears the name of Mistassini, or "Great Rock." This is also the designation of a large lake on the Hudson Bay slope of Labrador, and was applied by the early Jesuit explorers to the river under the impression that this stream connected Lake Mistassini with St. John Lake.

Other watercourses, such as the Peribonka, Ashuapmushuan, Wiachwan, and Metabechuan, converge on this lacustrine basin, which is of nearly circular form and at present 370 square miles in extent; but it was formerly much larger, as shown by the belt of sands encircling the whole periphery. These great northern streams, often several thousand yards wide at their mouth, wash down enormous quantities of sands, and the Mistassini itself is even known by the name of the "Sandy River."

In the month of October Lake St. John is already frozen, and in the depth of winter it is traversed in all directions by sledges. According to the seasons the level varies greatly, the flood waters rising at least 16 and in some years as many as 25 or 26 feet. Although the mean depth is only from 50 to 65 feet, the sounding-line has revealed the existence of a profound trough about a mile wide, which runs along the west side south-eastwards in a line with the axis of the Ashuapmushuan valley, and which is said by Dumais to range from 200 to 250 and perhaps even 300 feet in depth.* This "crevasse," as the fishermen call it, reappears farther on in the Green Lake, the Kenogamishish with its southern prolongation, the Kenogami, 1,000 feet deep, and again in the Ha-Ha and the lower Saguenay. This series of fissures evidently represents an ancient fjord at one time occupied by a glacier, but to a great extent obliterated, since the remains of the moraines have been swept away by the running waters. East of Lake St. John the crevasse, formerly continuous, has been broken into separate basins, the beds of which are being slowly raised.

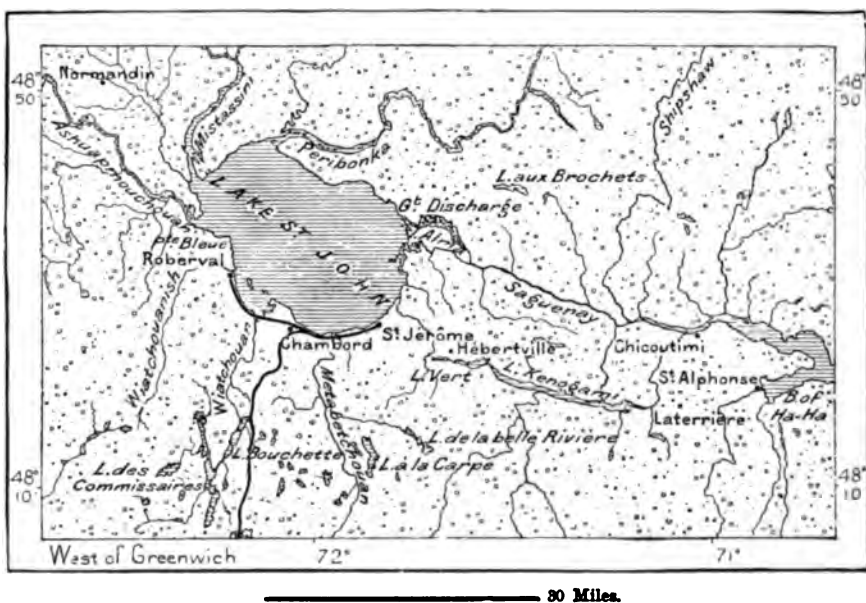
* Dumais, *MSS. Notes*. Joseph Rosa's chart, however, gives only 200 or 206 feet for the deepest part.

After the effacement of the original passage, other openings were necessarily formed, and at present the overflow of St. John Lake escapes through the so-called great and little discharges, which meet lower down to form the Saguenay proper. In its upper course this torrent differs little from the other characteristic Canadian streams, cascades, rapids and still waters ("dormant") following in quick succession to the *Terre Rompue*, near the point where the Chicoutimi emissary of Lake Kenogami rushes over a great cataract down to the Saguenay. Here the main-stream, nearly 1,200 yards broad and dominated by frowning cliffs, already presents the aspect of a great river.

Farther down it becomes still wider, and at the junction of Ha-Ha Bay assumes the character of a Norwegian or Alaskan fjord. On both sides of the

Fig. 117.—LAKE ST JOHN.

Scale 1 : 1,400,000.



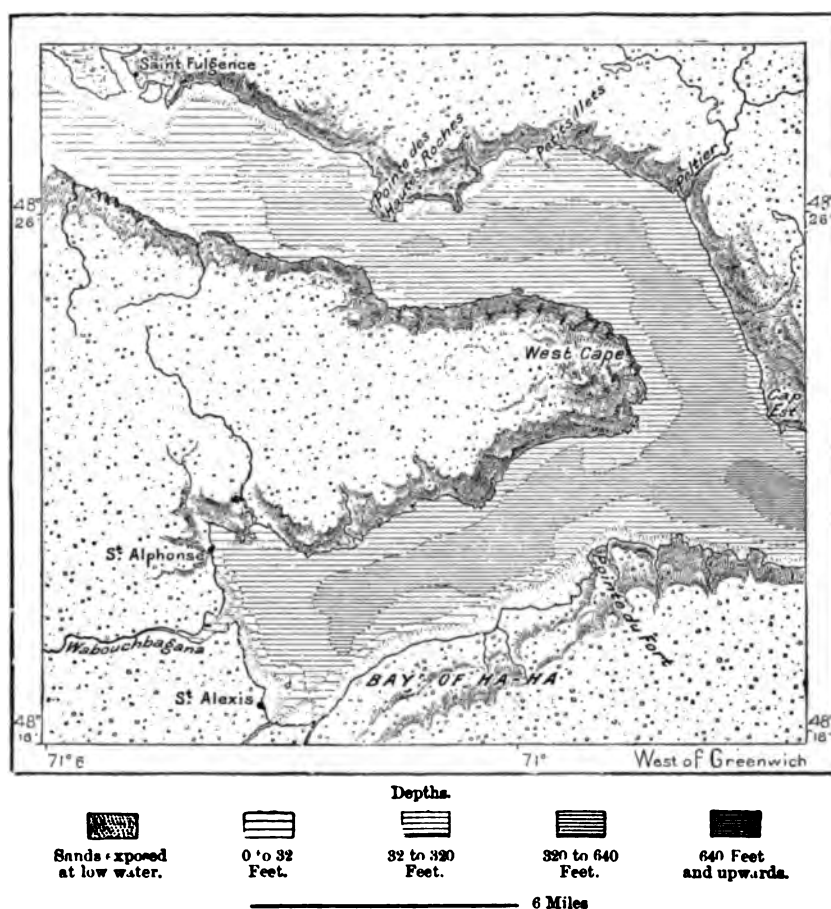
sinuous stream, which varies in breadth but is nowhere less than several thousand yards from shore to shore, the rocky banks rise higher and higher. Here the river, whose dark waters are richly charged with organic matter, assumes a gloomy aspect, whence its Indian name of the "Dead River." Although not "fathomless," as has been asserted, despite Bayfield's soundings in 1830, the channel is enormously deep, no less than 900 feet near its mouth; but like all fjords it terminates in the St. Lawrence estuary with a sill covered by no more than from 40 to 60 feet of water.

Every summer visitors flock in crowds to contemplate this astonishing marine inlet with its superb gneiss or syenite cliffs rising hundreds of yards above the water. One of these bluffs on the south side has been called the "Tableau" from its perfectly smooth face, as if prepared for some monumental rock inscription;

another, also on the south side, has been dedicated to the "Trinity" because of the three enormous superimposed steps presented by its escarpment, which has a total height of 1,650 feet. East of this headland the shore is indented by a semi-circular bay, and the reverse of Cape Trinity appears absolutely vertical, or even at some points overhanging. Facing it on the other side of the bay, but on the same side of the river, rises another promontory, for which the solemn majesty of the scene has suggested the name of "Eternity." Though higher than the other

Fig. 118.—UPPER SAGUENAY AND HA-HA BAY.

Scale 1 : 270,000.



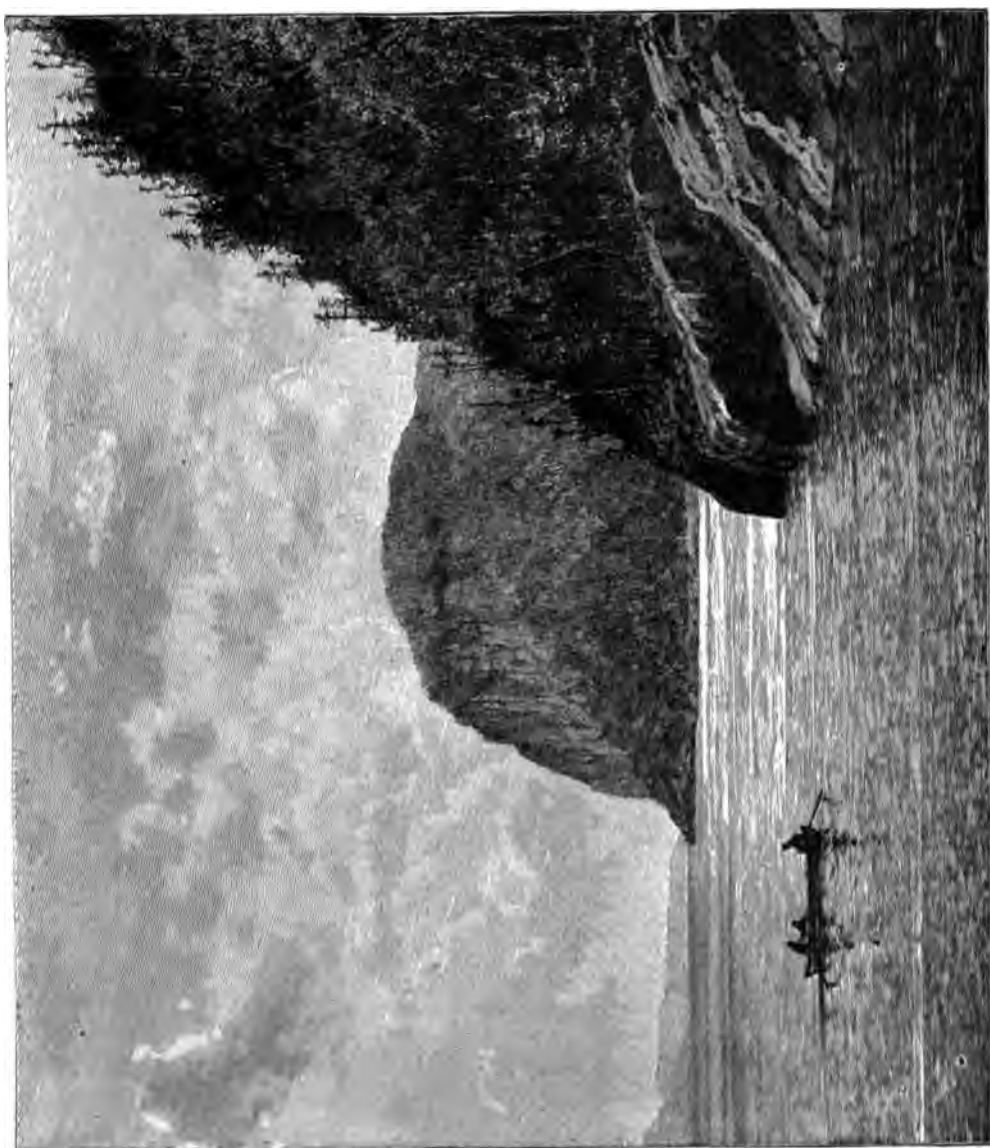
this cape is of less formidable aspect; it is rounded off above and its terraced slopes are clothed with timber. Here was arrested the terrible forest conflagration of 1872.

Below Cape Eternity follow other famous headlands along both shores of the Saguenay, which is here joined by several rivulets and even rivers, such as the St. Margaret, a noted trout stream visited in summer by hundreds of anglers.

South of the St. Lawrence, the elongated and deep Temiscouata Lake lies in

the prolonged axis of the Saguenay, and is continued in New Brunswick as far as the Bay of Fundy by the deep valley of the St. John River. Thus it would seem as if the two fissures now separated by the broad estuary of the St. Lawrence are two sections of the same fault in the terrestrial crust partly filled in, but still capable of being traced. When the St. Lawrence flowed through the Hudson

Fig. 119. - ETERNITY CAPE - VIEW TAKEN FROM TRINITY CAPE.



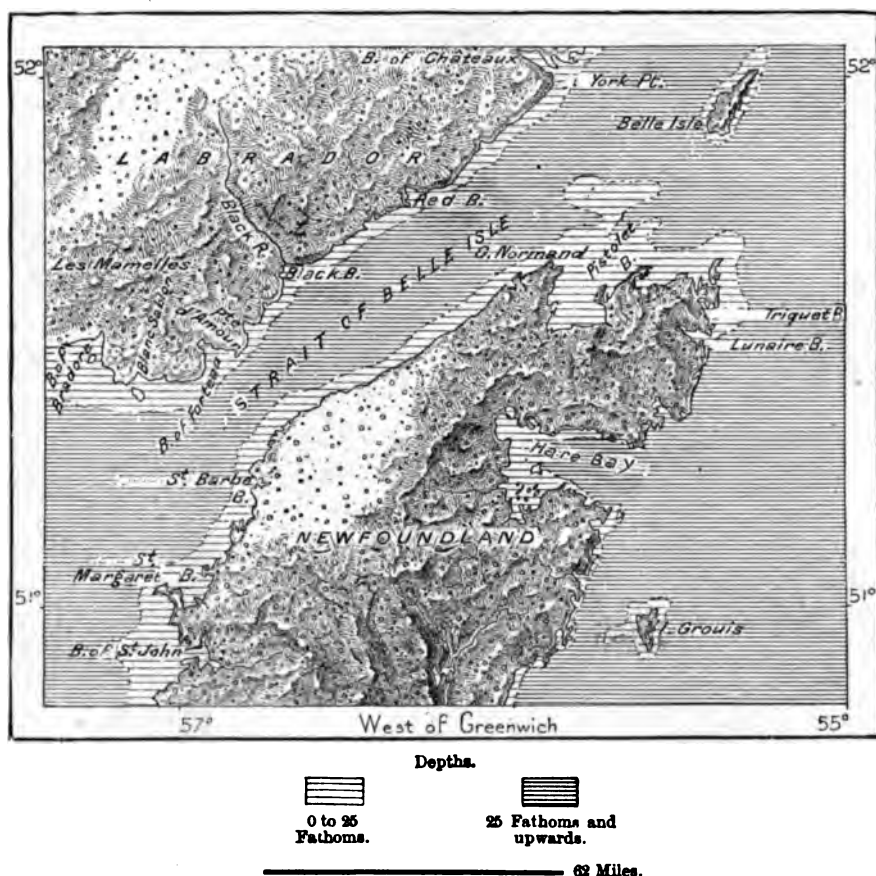
valley to New York Bay, the Saguenay would appear to have flowed from St. John Lake through St. John River to the Bay of Fundy.

Below the Saguenay, the estuary still continues to receive some considerable affluents, all on its left or north bank. On the south side the space between the hills and the coast is too confined to give rise to any large streams. But another

striking contrast is presented by the opposite shores of the Laurentian estuary. The south coast develops a curved contour-line of remarkable regularity, which is evidently due to the action of a current at work for ages rounding off the sharp headlands, filling the creeks and inlets with sand, and thus gradually effacing all natural rugosities. This current is that of the ebb-tide, which is always more continuous and less irregular than that of the flow. The north coast exposed to the rising tides is far less uniform in its general outline, and here is found the Pointe

Fig. 120.—BELLE-ISLE STRAIT.

Scale 1 : 2,500,000.



de Monts, the most conspicuous headland and chief landmark of seafarers at the entrance of the estuary. The irregularity of this seaboard is further increased by the alluvia of the Betsiamite, Outardes, Manicouagan, Moisie, Mingan, St. Augustin and other streams from Labrador, which develop little sandy and muddy deltas advancing beyond the normal coastline.

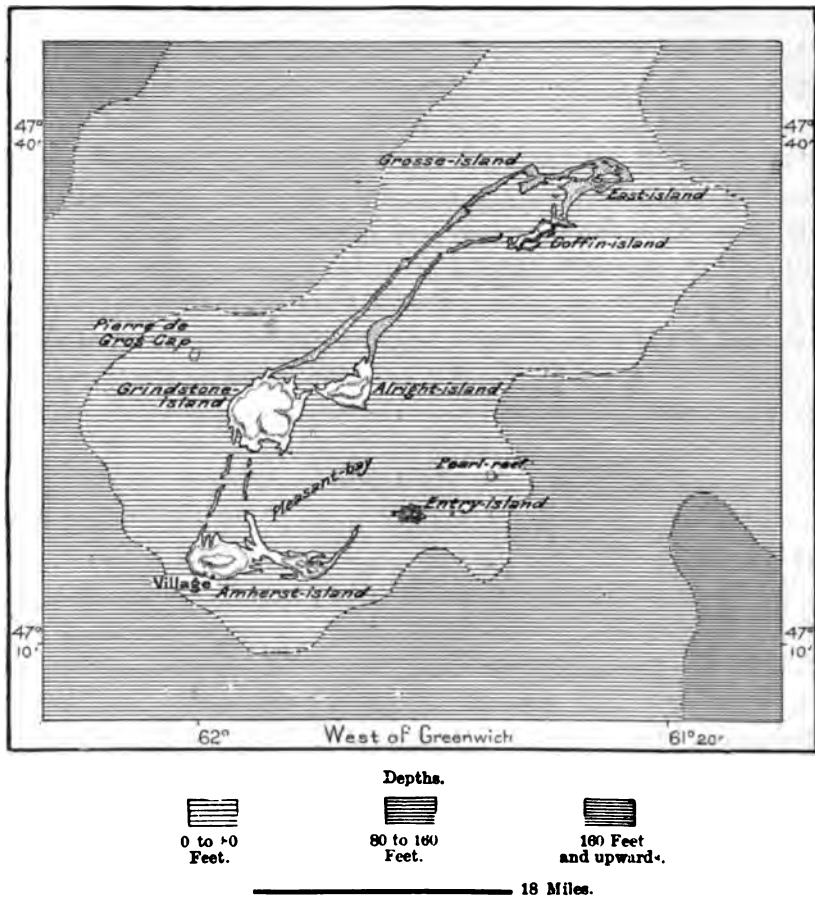
The St. Lawrence estuary, 110 miles broad at the entrance, contains numerous islands, all disposed parallel with the coast in the direction of the tidal currents. Such is Orleans, the Bacchus of the early navigators, nearly 20 miles long, situated just below Quebec. Such also is the far larger Anticosti, lying in mid-

channel at the other extremity of the estuary, which retains in a somewhat modified form its Indian name, Naticostek, "hunting-ground of the bear." About 135 miles long and 30 broad in its central part, this monotonous insular mass presents the form of a plane sufficiently inclined southwards to shelter it from the stormy northern winds, and give it a relatively mild climate.

Anticosti is of silurian formation, consisting of calcareous strata, abounding in fossil wood, and covered on the south side with almost impenetrable thickets of

Fig. 121.—MAGDALEN ISLANDS.

Scale 1 : 1,200,000.



conifers, 10 or 12 feet high. It appears never to have formed part of the mainland, for it contains none of the reptiles found on either side of the estuary. Whole families of insects common on the neighbouring coastlands are also absent, while the black bear has evidently crossed over in winter, when the surrounding waters are ice-bound.

At Anticosti the estuary merges in the Gulf of St. Lawrence, a shallow basin apparently excavated by erosive action in relatively recent times. The former continuity of the land from shore to shore is attested by the uniform character of

the geological formations round the whole basin, which is even shallower than the Saguenay fjord. Depths of 600 or 700 feet are rare, and the section comprised between the Gaspé Peninsula and Cape Breton nowhere exceeds 360 feet. But at Cabot Strait, south of Newfoundland, the electric cables rest on a submarine bed from 1,450 to 1,650 feet deep.

Besides this strait, the gulf communicates with the Atlantic through two other passages, the Straits of Belle-Isle and the Gut of Canso (Canseaux), the latter a narrow channel 17 miles wide, flowing between Cape Breton and Nova Scotia, and consequently of great importance for the coasting trade. Belle-Isle, so called from the island of that name at its northern entrance, is a broad channel flowing north-east and south-west between Labrador and the northern limestone peninsula of Newfoundland. West of this passage lies the serpentine inlet of Bradore, from which most etymologists derive the term "Labradore." Near this point is the Esquimaux (Eskimo) River, which recalls the memory of the ancient "Skräl-linger" met by the Norsemen at this eastern extremity of Labrador.

Through the Belle-Isle Strait a branch of the polar current penetrates into the Gulf of St. Lawrence in spring and summer, strewing the water between Anticosti and Labrador with drift ice of every imaginable form and size. This flotsam together with the frozen masses sent down by the St. Lawrence constitutes one of the dangers of the navigation, which in Belle-Isle Strait is delayed till the month of July. But still greater dangers are caused by the fogs and shifting currents, which would render the navigation almost impossible but for the aid of alarm-guns and fog-signals continually kept going.

To the current penetrating through the Strait of Belle-Isle is opposed the stream entering by the broader passage south of Newfoundland. The two currents converging in the gulf, and clashing with a third from the St. Lawrence estuary, set up a vast gyratory motion to which is certainly due the semicircular form of the coasts extending from the Gaspé Peninsula to the terminal point of Cape Breton. To the same cause must in a great measure be attributed the crescent shape of Prince Edward Island, and the double hook of the little Magdalen group, whose outlines recall those of the atolls in the Pacific Ocean.

Eruptive forces have also been at work in these waters. One of the southern islets of the Magdalen group, the Entry Island of the early navigators, presents the curious spectacle of a twin cone of trappean rock about 400 feet high encircled at the base by a sandstone pedestal.

CLIMATE OF THE LAURENTIAN BASIN.

The climate of the Canadian regions traversed by the St. Lawrence differs considerably from that of European countries lying under the same latitudes. Thus the island of Point Pelé in Lake Erie, southernmost land of the Dominion, lies at the same distance from the North Pole as Rome, and 45° latitude, which may be regarded as the median line of the Laurentian lands, passes in Europe across South France, Lombardy, the valley of the Danube and the Crimea. But apart from the extreme southern section of the basin, that is, the peninsular

region formed by Lakes Huron, St. Clair, and Erie, which enjoys a temperate climate like that of West France, as shown by its gardens, orchards, and forest. trees, all the rest of the Canadian territory is far less favoured than the corresponding European lands.

Owing to the general movement of the marine and atmospheric currents the west European seaboard under like parallels is much milder than that of the eastern shores of North America. Here the prevailing winds set from the pole, blowing north-east and south-west, that is, right up the St. Lawrence estuary. The other cold winds from the north and north-west find little obstacle in sweeping over Labrador, Hudson Bay, and the Laurentides, whereas the warmer south-east currents from the West Indies are more easily deflected from their course by the New England uplands and the range skirting the Lower St. Lawrence.

Hence the climate of the St. Lawrence basin, without offering the same extremes of heat and cold as in Manitoba, is much more severe than that of the Seine basin. At Montreal the glass fell in January, 1889, to -41° F. At the same time the heats are also more intense, and in general the winters and summers are longer, the intermediate seasons less marked, than in west Europe. After the long and severe winter months nature revives almost instantaneously, and after a short but delightful autumn, it is again almost as suddenly stilled. In the four or five months between May and October, the flora runs through the complete cycle of its biological functions.*

Although dreaded by Europeans, the long winter is regarded by the Canadians themselves as their finest and most enjoyable season. In any case it is the season that makes men strong and robust, which invigorates the race and endows it with a more intense vitality, cheerfulness and energy. It is also the season of feasts and merrymakings. The snowfall is not heavy,† and usually occurs in November, remaining on the ground throughout the winter. Clear skies and bright suns prevail, and although the surface snows may melt during the day in places exposed to the solar rays, they again freeze at night. Not only the plants, but the houses themselves are protected from the cold by their white winter covering. Occasionally the snow, usually about 40 inches deep, is blown about by the high winds and may then be seen whirling round in dense masses and accumulating to great depths in the hollows, under the escarpments and in other places sheltered from the gale. Sledges struggle in vain against these fierce snowstorms, and despite all precautions, the railway trains themselves often get snowed up.

* Temperatures in various parts of Canada :—

	Latitude.	Mean. Temp.	Winter. Dec.—Feb.	Summer. June—Aug.
Port Arthur (L. Superior) . . .	$48^{\circ} 27'$	37° F.	7° F.	60° F.
Windsor (Ontario) . . .	$42^{\circ} 19'$	48°	27°	69°
St. Enilion (Temiscaming) . . .	$47^{\circ} 20'$	38°	16°	65°
Toronto (40 years) . . .	$43^{\circ} 39'$	43°	23°	68°
Montreal (10 years) . . .	$46^{\circ} 31'$	45°	20°	67°
Quebec (10 years) . . .	$46^{\circ} 48'$	39°	14°	63°
Belle-Ile . . .	$51^{\circ} 58'$	28°	(?)	49°

† Mean annual rain and snowfall in the Laurentian basin, 30 to 40 inches.

FLORA.

The Laurentian basin is essentially a forest region; except in the rocky western districts, the whole land not cleared for cultivation is still thickly covered with timber. Even the abandoned clearings and the tracts ravaged by fire are soon again overgrown with plants of less economic value but of more rapid growth. From one end of the land to the other the general aspect of the woodlands changes little in the direction from east to west, the chief contrasts occurring between the northern and southern regions owing to the differences of temperature. Thus the walnut forests of the southern districts of Ontario watered by Lake Erie disappear farther north; the red cedar also extends no farther than the Huron and Ontario basins, and corresponding limits are assigned to other species, such as the white oak, beech, sugar-maple, white and red pine. For the most part the limiting lines of vegetation present a rough parallelism with the isothermals which are disposed south-west and north-east in the direction of the St. Lawrence valley.* North of the Laurentide range, and especially beyond the Height of Land, the forest trees, being exposed to longer and more rigorous winters, are of smaller size than those of the fluvial region.

Dominant amongst the sixty species of forest trees are the conifera, which resemble the analogous European forms and bear the same names, such as pines, firs, spruces, yellow, red, grey, or white cedars, arborvitæ (*thuya Canadense*), and others. The willow family is represented by the poplars ("liards"), balsams, and other forms. One of the most valuable trees is the white birch, of which the Indians make their bark canoes light enough to be transported by a single man across the portages. The forests also yield several fruit-bearing trees, notably the cherry, and shrubs giving an abundant supply of edible berries. The sugar maple (*acer saccharinum*) is distinguished by its rapid growth and the splendid tints of its autumn foliage no less than by its majestic form, excellent timber, and the great abundance of saccharine contained in its sap. From this syrup is made a highly esteemed sugar, some of the larger trees yielding as much as 600 or 700 pounds in the season. The maple has been chosen as the emblem of their nationality by the French Canadians, who drape their banners with it on festive occasions. Its northern limit is also that of the wild vine, which coils round the tall trees and hangs its bunches of grapes from every branch.

Most of the forest region still belongs to the Government, and is divided into lots successively farmed to speculators. The timber merchants who rent the so-called "limits," that is, tracts parcelled out into so many tens or hundreds of square miles, undertake to prevent all useless destruction. After selecting the trees required to be felled and transported, they must leave the rest, and restore to the State the lots undeteriorated. But such provisions are nugatory, and the forests continue to be recklessly destroyed without a thought for the future.

The woodmen, engaged in the autumn, ascend the rivers in order to reach the "heights" in time to establish their "camps," and begin work as soon as the

* Robert Bell, *Map showing the general northern limits of the principal forest trees of Canada.*



ENCAMPMENT OF CANADIAN WOODCUTTERS.



ground is covered with snow. The winter season is utilised for felling the timber, which is transported across the hard slippery ground to the torrents and piled up along the banks. Then as soon as the ice melts the logs are sent adrift and floated down attended by boatmen armed with hooks to clear away obstacles, prevent "jams," and keep the waterway open. These men are exposed to many perils about the falls and rapids, some of which they shoot on the rafts constructed of the timber; they also suffer much from the moisture and from damaged provisions, causing a kind of scurvy known as "black leg." But those who escape these dangers generally acquire a remarkable degree of strength, skill, firmness,

Fig. 122.—TIMBER AFLOAT AT THE OTTAWA SAW-MILLS.



and presence of mind. Most of these intrepid "draveurs" are of French-Canadian origin; they delight in braving death, and may be seen rushing the swift stream as they spring from block to block, or even descend the cataracts clinging to a single log. Yet despite these constant risks accidents would be far less numerous but for their love of drink, indulged in on feast-days and after receiving their wages. They are fond of the poetry of their romantic calling, and for them, sometimes by them, have been composed the most popular Canadian songs:—

“ Nous avons sauté le Long Sault,
 Nous l'avons sauté tout d'un morceau !
 Ah ! que l'hiver est longue !
 Dans les chantiers nous hivernerons,
 Dans les chantiers nous hivernerons !
 • • • • •

Rouli, roulant, ma boule roulant,
En roulant ma boule roulant,
En roulant ma boule." •

To the woodmen succeed the tillers of the soil; the former thin the forests, the latter destroy them. In the immediate neighbourhood of the towns or landing stages they fell the timber with axes; but in remote districts, where it cannot be brought to market, they fire the woods to clear the ground for their crops and orchards. But years often pass before the roots can be entirely got rid of; at times also the process proves too costly; the plot is abandoned, undergrowths resume possession of the soil, and the charred trunks of the forest giants disappear beneath a tangle of creepers.

During the months of August and July fires are forbidden, owing to the danger of their spreading in the dry weather far beyond the intended limits. But despite all precautions the flames are at times fanned into destructive conflagrations, which can be arrested neither by stream nor lake until they have burnt themselves out. Thus a few years ago such a fire destroyed all the woodlands in the Saguenay region stretching from Lake St. John to the Metabetchouan river and thence to Cape Eternity. In every part of Canada are met such "brûlés," or fired districts, where the woods take a long time to spring up again. Amongst the species threatened with destruction is the useful black walnut (*juglans nigra*), which is all the more valuable that it serves for grafting on the European variety.

FAUNA.

All the large wild animals tend to disappear with the primeval forests. The Laurentian basin, which during the early days of colonisation supplied the French trappers with nearly all their peltries, now imports from the North-West Territory the furs so lavishly worn by the Canadians. The moose-deer and the other cervidæ are met only in the more remote parts, and even the beaver has been driven far to the north. A few pumas are still seen, but bears are very numerous. In the fluvial waters cetaceans are becoming rare, and the whale no longer follows in the wake of vessels as far as Montreal. Those "sea cows" have disappeared that gave their name to so many points along the shores of the gulf and estuary; the seals also have ceased to penetrate through the Richelieu river to Lake Champlain, just as they have ceased to frequent the Hudson and the estuaries on the New England seaboard. Nevertheless the porpoise still ascends the Saguenay 600 or 700 miles from the high sea.

Wild beasts have been replaced by domestic animals, horses, cattle, sheep, goats, imported from Europe; the bird tribe also has been partly renewed by the introduction of poultry, pigeons, and the audacious sparrow, whose depredations have already caused the colonists to regret its appearance in the New World.

INHABITANTS.

The aborigines have certainly diminished since the arrival of the first Europeans. Cartier and Champlain met Indians in every part of the territory,

• Ernest Gagnon, *Chansons populaires du Canada*.

and at that time their scattered groups probably exceeded 100,000 between the Mississippi portages and the entrance of the St. Lawrence estuary. At present these groups are reduced to a few mostly settled communities lost in the surging tide of white colonisation. Including those still in the wild state beyond the "Height of Land" towards the shores of Hudson Bay, they number perhaps not more than 30,000 altogether. Living by the chase and fishing, the descendants of the original owners of the land necessarily decreased according as game disappeared or fell into other hands. They retreated before the intruding Europeans, just as they themselves had driven north or exterminated the Innuits or Skrällinger, who under the name of Eskimo still survived on the Gulf of St. Lawrence down to the last century, and whose remains are met throughout the whole region of the Great Lakes. If the few remnants of the Indian tribes still hold their ground, and even increase in some of the reserves assigned to them, it is only on condition of completely changing their mode of life, by becoming tillers of the soil, artisans, sailors, and intermingling more and more with the whites even by marriage.

In fact, the Canadian Indians have scarcely any longer any true representatives. They live only in history and legend. Their civilised settlements near Montreal reveal their inner life less vividly than the sepulchral mounds scattered over various regions, but especially on the shores of Lake Huron and Georgian Bay, as well as on the portages about Lake Superior. The wild tribes were accustomed to deposit their dead on the bare rock, protecting them with large stones from predatory beasts; then after a few years the bones were collected and interred in some conspicuous place, usually near a portage or on a bluff or headland wherever there was enough earth to raise a mound, which became an object of veneration for their descendants. On the banks of the Rainy River all such barrows are covered with a little birch-bark roof, with a narrow opening on the south side where the friends of the departed offered tobacco, rice and other presents during their periodical visits to the grave.*

Formerly the Indians deposited in the common or private graves their most valued treasures, such as furs, necklaces, arms, copper kettles, instruments and jewellery. These deposits have supplied to archæologists the materials for reconstructing the social history, the arts, industries and general culture of the aborigines.

Before the arrival of the whites to help in the work of extermination, the Indians themselves were constantly massacring each other. Everywhere the local names recall their sanguinary conflicts, and on such sites the very bones are often collected of those who perished in the fight. Thus were found on the banks of the French River a heap of human remains, representing a whole tribe of Iroquois massacred to the last man by the Hurons. The Iroquois in their turn destroyed the Huron villages which were formerly dotted thickly over the shores of Lake Simcoe, and of which nothing is now seen except some charred timber. One day the Huron braves were descending the St. Maurice above the Chaounigan Falls. The prows of their canoes had just been turned towards the beach when a

* H. Youle Hinde, *Canadian Red River, and Assiniboine and Saskatchewan Expeditions.*

numerous band of Iroquois were discovered lying in ambush behind the trees. With one accord the Hurons again steered their boats towards the already swiftly rushing current, and the notes of their death song and of the defiant whoop hurled against their implacable foe were presently intermingled with the roar of the raging cataract.

In the absence of written records some of these desperate struggles are commemorated in the popular Canadian songs:—

“ Un noir corbeau, volant à l'aventure,
Vient se percher tout près de ma toiture.
Je lui ai dit : ‘ Mangeur de chair humaine,
Va-t'en chercher autre viande que mienne ;
Va-t'en là-bas, dans ces bois et marais,
Tu trouveras plusieurs corps iroquois ;
Tu trouveras des chairs, aussi des os.
Va-t'en manger, laisse-moi en repos.’ ”*

In a short period of four centuries, the same lands have been successively deserted and repopled by men of different origin—Algonquins, Hurons, Sioux. But most of the survivors belong to the great Algonquin family. In the upper basin and along the shores of Lake Superior are found the descendants of Saulteux or Ojibways akin to those of Lake Winnipeg. Other Ojibways, as well as Mississaugas and Amikouis (Wyandots), dwell on the north side of Lake Huron, the former hunting-ground of the Outawais (“ Oreillards ”), called by Champlain “ Cheveux relevés ” from their fashion of wearing the hair tied in a knot on the top of the head. For the same reason others, whose descendants still linger about the headwaters of the St. Maurice, are known as “ Têtes de Boule.”

The Nipissings, Temiscamings, and Abittibis receive their names from the northern lakes, where their posterity is not yet quite extinct. North and south of the Ottawa, whose name recalls a momentary sojourn of the Outawais, two rivers are known as those of the “ Little Nation ” from an Algonquin people of less importance than the “ Great Nation,” the Algonquins proper, whose villages stretched along the middle course of the St. Lawrence above the estuary. All branches recognised as “ Fathers ” the southern Algonquins, or “ Wolves,” better known as Delawares, or Lenni-Lennape, that is, “ Men of Men,” who gave to their kindred tribes the names of “ Children ” and “ Nephews.”†

In the northern forests of the lacustrine regions lurked the Papinachois and the Attiakmegs (Attikamegs), or “ White Fish,” so named from their chief food. The inhabitants of the Laurentides and of the Height of Land, who are at present the most numerous represented, took their general designation of “ Montagnais,” or “ Highlanders,” from the nature of their territory. Lastly, about the lower part of the estuary, and on the north side, the French met the Abenaki, or rather, Wabanaki, that is, “ People of the Dawn,” or “ Eastlanders,” who are frequently mentioned in the early chronicles, and whose national poetry takes a conspicuous place in the history of native American literature.‡

* Ernest Gagnon, *op. cit.*

† Francis Parkman, *The Conspiracy of Pontiac.*

‡ Lighthall; Leland; John Reade, *Transactions of the R. Soc. of Can. du*, 1887.

Of all the Algonquins of the Laurentian basin, the Montagnais are the least removed from the primitive state, thanks to their forest life, remote from all white settlements. North of the Height of Land there are some who have even resisted the influence of the missionaries, while others, abandoned by the priests, have reverted to their pagan practices. Their idiom differs greatly from the Algonquin dialects current on the St. Lawrence, and in their relations with the surrounding tribes they make use of a common trade jargon.

The second ethnical family in the Laurentian basin was that of the Yendats (Wyandots), to whom the French gave the name of "Hurons," from *hure*, a wild boar's head, to which their style of headdress gave them a certain resemblance. They dwelt on the east side of the "Freshwater Sea," which bears their name, and south-eastwards in the Erie and Ontario basins. Their neighbours and allies were the Petuneux, or "Tobacco People," who occupied the shores of Georgian Bay.*

In the middle of the seventeenth century the Huron nation was most numerous west of Lake Simcoe, where it possessed thirty-two villages with a total population of at least 11,000. Some writers even speak of 30,000 or 35,000 centred in this peninsular district of Ontario. They must have been far more widespread at an earlier period, but the relentless hostility of the kindred Iroquois had compelled them to contract the limits of their domain, and to live in a relatively compact body. Thus nearly the whole territory comprised between the river Ottawa and Lake Simcoe had been abandoned.

Then came a day when the rich Huron land itself was changed to a wilderness. Instead of crowded village names, the French maps of the eighteenth century show nothing but that of the "Destroyed Nation." In this district M. Taché has examined sixteen huge "charnel-houses," one of which contained over a thousand skeletons heaped together in disorder, and mingled with all kinds of objects, pipes, glass beads, strings of shells, copper ornaments of Mexican origin, other ornaments and instruments procured from the French.

The north side of Lake Erie with the Niagara River valley was held by the "Neutral Nation," who vainly endeavoured to maintain the balance of power between the Hurons and the Iroquois. According to some etymologists, their tribal name Onghiarah is perpetuated in a modified form in that of the famous river and its falls.

According to Charlevoix, the Iroquois, a nation of warriors and orators, were so named from the formula with which they concluded their speeches: *hiro*, "I have spoken," followed by the exclamation *kwé!* uttered in a tone of jubilation, sadness, or rage, according to circumstances. But they called themselves Hottinonshiendi, "Hut-builders," and their dwellings were in fact larger, better built, and more strongly fortified than those of their neighbours.

The chief seat of the Iroquois race lay south of Lake Ontario, where are still the reserves of their five original branches, the "Five Nations,"† which after

* F. X. Garneau, *Histoire du Canada*.

† Senecas or Tsonnontuans, Cayugas or Goyogwins, Oneidas or Uneyuts, Mohawks or Mahakuse, and Onondagos.

their alliance with the southern Tuscaroras became the "Six Nations." The most formidable of all were the Mohawks, whose ascendancy was so marked that they at last came to be regarded as the chief representatives of the confederacy. Nearly always victorious in battle, thanks to their valour, tactics and prestige, the Iroquois had arrogantly assumed the title of "Men superior to all others." They figure conspicuously in legend and romance, and have been selected by many writers as the true type of the Indian. Nevertheless, they differed in many respects from the other natives, and especially from their Algonquin neighbours,

Fig. 123.—INDIAN TRIBES AND EUROPEAN COLONIES AT THE BEGINNING OF THE 18TH CENTURY.

Scale 1 : 35,000,000.



Regions colonised at the beginning of the 18th Century.

620 Miles.

by whom they were surrounded on the west, north, and east. The Algonquins were still mainly in the hunting and fishing state, whereas the Iroquois already cultivated the soil. The Iroquois language, common also to the Wyandots, differs greatly from that of the Algonquins. It is remarkably deficient in consonants, and lacks the labial series (lip letters) altogether. Thus the vowels prevail, giving great softness to the language, which is nevertheless copious, strong, sonorous, and admirably suited for oratorical display. It is said to have changed little since the arrival of the whites. The Indian willingly learns foreign languages, but safeguards the purity of his own.

According to a local tradition, the Iroquo's formerly occupied the banks of the St. Lawrence towards the Ottawa confluence, but were driven thence by the Algonquins. When Champlain penetrated into the interior at the beginning of the seventeenth century, they were still engaged in recovering the lost territory, and were driving Hurons, Montagnais, and Algonquins before them. Champlain himself, despite his usual good sense and rectitude, allowed himself to be involved in these political struggles. He joined the Huron alliance and was successful; but Iroquois vengeance could bide its time, and long after his removal from the scene the war broke out again more fiercely, more relentlessly than ever.

The Iroquois, to whom the Dutch had sold firearms in the middle of the seventeenth century, joined the whites, that is, the English colonists on the Atlantic seaboard, who were reported to be more liberal than the French. Thus while the King of France was allowing the Hurons forty shillings for every English scalp, the King of England was giving eighty for that of every Frenchman.* But in the long run the Iroquois' power dwindled to little or nothing, and they were driven by the Ojibways and Mississaugas from all the western parts of the great lakes. Then this savage warfare was merged in the shock of the two leading European nations, and the struggle in which Champlain had been induced to take part was decided in 1760 before the walls of Quebec.

After the war of American Independence, many Iroquois, who had remained loyal to Great Britain, crossed the borders and sought refuge amongst the French Canadians. Here they found some of their own tribes, and amongst the mixed descendants of both are met those who are proudest of their past glories. In the province of Ontario were also founded some Iroquois colonies, now civilised and more or less merged in the surrounding Anglo-Saxon population. Pauline Johnson, one of the best local "English" poets, is an Iroquois lady.†

The schools, in which the aborigines learn French or English, the Catholic or Protestant churches where they worship, the common social and political life, lastly, alliances with the whites—everything tends to their ultimate absorption. Nevertheless, the civilised Indian families still cling with tenacious pride to the glorious memories of their race, and even claim the name of "Savages," rejecting as an insult that of "Indians," applied to them by the English in later times.

Iroquois, Hurons, and Algonquins have still their national feasts, their songs and sports. Each member of the community carefully guards his *totem* (better *otem*), the representation of the symbolic object, whether animal or plant, by which he is connected with the tribe or clan. It is amongst these civilised communities that an increase of population has been observed, a fact bearing eloquent testimony to the equity of the Canadian Government in its dealings with the old owners of the land. If the hunting tribes diminish, the agricultural communes are normally increasing, while gradually losing their distinctive characteristics.

The first essays at European colonisation were made under almost insurmountable difficulties. Jacques Cartier and Roberval merely visited the country without

* P. A. de Gaspé, *Les anciens Canadiens*.

† W. D. Lighthall, *Songs of the Great Dominion*; *Athenæum*, Sept. 28, 1889.

leaving any settlers behind them. In 1599, sixty-five years after Cartier's first voyage, Chauvin, armed with a royal concession, attempted to found a first permanent establishment in Canada, selecting for the site of his "*maison de plaisance*" Tadoussac, at the St. Lawrence and Saguenay confluence. Here sixteen persons were left to pass the winter; but next year all were dead or dispersed amongst the Indians.

Chauvin's successors directed their attention to the seaboard, and after numerous vicissitudes, a fresh start was made by the foundation of Port Royal, on the Bay of Fundy, which was afterwards abandoned and again rebuilt. This station, the modern Annapolis, is the first Acadian settlement; but the Canadians, properly so called, date their history from the foundation of Quebec in 1608. This slow progress was due to the prevailing monopoly system. Thus, in 1602, Acadia was the property of Poutraincourt, and all the rest of "New France" was regarded as belonging to Mdlle. de Guercheville.

Those authorised by Henry IV. to trade with the "*Terres Neufves*" and the neighbouring coasts, were required not only to remove all strangers from the conceded territories, but even to expel all Frenchmen found intruding in those parts. In 1603 the king forbids all captains, pilots, mariners, or others of the ocean sea to carry on any trade or traffic in the river higher up than the district of Gaspé. Doubtless these orders were mostly disregarded, and the Basque and Breton fishermen continued to visit the entrance of the estuary; but they did so at their peril, and were liable to be pursued and captured, they and their vessels, and brought to France "to be dealt with according to the law."

To the commercial monopolies was added religious intolerance. During the first essays the Protestants showed most eagerness to join the expeditions, and, considering the state of France at that time, it was natural to expect that the persecuted Huguenots would readily seek to found new homes beyond the seas. The shores of the St. Lawrence would have been rapidly colonised, as were those of the Atlantic by the English Dissenters during the course of the seventeenth century. But after some hesitation, inspired by the tolerance of Henry IV., the policy of the official colonisers was finally adopted, and all "heretics" were excluded from Canadian territory. Unity of faith was the primary consideration, and the priests, charged with the conversion of the aborigines, had also to look after the orthodoxy of their white fellow-countrymen. "The king," said Pontchartrain, after the Revocation of the Edict of Nantes, "the king has not expelled the Protestants from France to allow them to set up a republic in the New World." Even the very Catholics of La Rochelle were regarded with suspicion.

Nor was this all. The French immigrants gave no heed to the cultivation of the land. Eager to acquire wealth, they wanted, like the Spaniards, to discover gold and silver mines, and return in a few years laden with the spoils. During their residence in Canada they sailed from inlet to inlet, everywhere in quest of mineral treasures. But being compelled to rest satisfied with the peltry trade, itself profitable enough, they looked to France for all supplies, and when the



FORT CHAMBLY, ON THE RICHELIEU RIVER, NEAR MONTREAL.



re-victualling vessels were weatherbound, the settlers were reduced to the last extremities, and many actually perished of want.

But of all the scourges the most dreaded was the "mal de terre" (land sickness), a kind of scurvy evidently caused by the bad provisions, absence of sanitary measures and home-sickness. A remedy against the terrible malady was found in agriculture, and Hébert, the Parisian, deserves mention as "the father of the Canadian race," the first who ploughed and sowed the ground.

Besides Tadoussac other sites, such as Cape Rouge above Quebec and Trois Rivières, were proposed as suitable places for settlements in the St. Lawrence valley. But in 1608 Champlain decided in favour of Quebec, which is undoubtedly the strategic port of Canada. The contemporary print still exists representing the strong "abitation de Quebecq," built on a terrace above the St. Lawrence estuary. But of the twenty-eight first settlers about twenty perished the first winter. Then some Algonquins came and built their huts round about the little fort; but for several years the only French inhabitants of Quebec were the hirelings who depended on the Company of Merchants, and who had no wives. The first family to settle in Quebec was that of the above-mentioned Hébert in 1617, and his eldest daughter was the first to be married here four years later. Thousands of Canadians trace their descent from this stock.

But it was only after the brief occupation of Quebec by the English in 1629 that the colony began to thrive. In 1641 the French took possession of the island of Montreal, and a fort was erected at the confluence of the Richelieu with the St. Lawrence on the spot where now stands the town of Sorel.

Then Fort Chambly, which became the eastern bulwark of Montreal against the English, was built on the margin of the lacustrine depression flooded by the Richelieu.

In 1672, a century before the British conquest, the French population between Montreal and Quebec numbered 3,418 souls, of whom 1,344 were capable of bearing arms. Despite the wars with the Iroquois and the still more ruinous struggles with the English, the population continued to increase, less by new arrivals than by the normal birth-rate. Apart from a few Parisian artisans, there were scarcely any immigrants properly so called before the year 1665. A certain number of adventurers came to share in the peltry trade, and a few scafarers settled near the fishing-grounds. Colbert sent a few regular colonists between the years 1665 and 1674; but later nearly all the settlers belonged to the military class, men who had received their discharge on the condition of marrying and remaining in the colony.

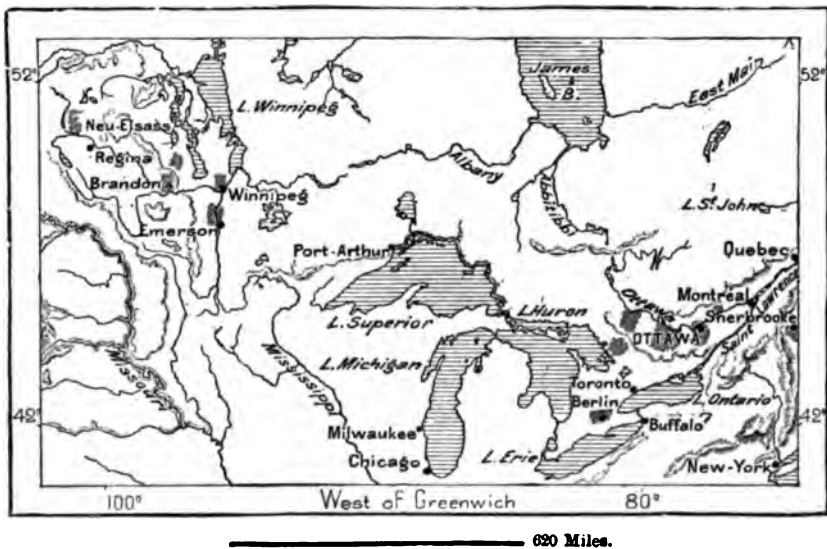
It has been asserted that the French Canadians are half-breeds. Such can only be the case in an infinitesimal degree, for those who penetrated into the inland forests and took native wives left their children in the maternal tribe, or else themselves remained and became assimilated to the Indians. In the colonies proper there were only seven marriages of whites with Huron and Algonquin women between 1608 and 1663, after which time the equilibrium of the sexes was already nearly established in the European communities. Charlevoix's statement

that nearly all were Normans is a mistake, although it is true enough that the great majority came from the west of France; scarcely any names of southern origin occur in Canada, but many families have taken the names of plants, animals, or localities, as well as those of the French towns whence they emigrated.

At the beginning of the eighteenth century the whole Franco Canadian population, including the Acadians, numbered 16,000, and during the last sixty years of French rule it was twice doubled. But while the French Canadians were increasing fourfold, the neighbouring English settlers had increased tenfold, from 262,000 in 1700 to 2,500,000 about 1760. It was thus foreseen that in case of a conflict the French colony would be crushed, and to avoid this danger it was even

Fig. 124.—CHIEF CENTRES OF GERMAN IMMIGRATION IN CANADA.

Scale 1 : 25,000,000.



proposed to convert the whole region into a vast penal settlement and transport thither all French convicts.

When the final struggle began in 1759, England was able to invade Canada at the centre and the two extremities simultaneously, and the three invading armies comprised altogether as many fighting men as there were inhabitants in the French settlements.* Hence the wonder is, not that they had to yield, but that they held out so long.

After the British occupation it seemed inevitable that the feeble Franco-Canadian element, totally severed from the mother country, and thinly scattered over a vast region without any important central rallying-point, must necessarily disappear in the surging tide of Anglo-Saxon ascendancy. But on the contrary the 60,000 Canadians, as the French element is usually called in a special sense, have become two millions, having increased thirtyfold since the conquest. This astounding growth has, moreover, been effected without any immigration from

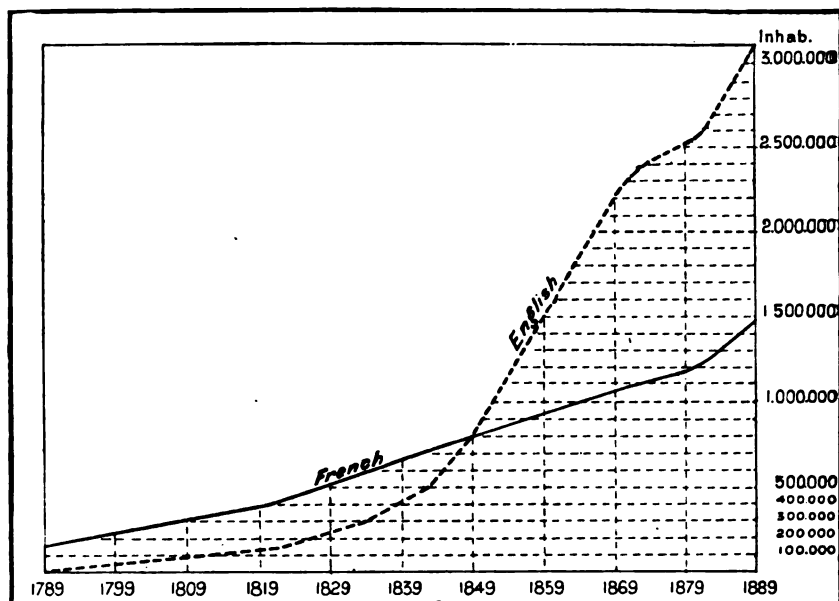
* Despatches of Montcalm, April 12th, 1759.

France for a whole century, none having taken place till 1872, when a few hundred¹ settled on the shores of the St. Lawrence. But a number of Scotch and English, many of them descendants of soldiers who came as masters and conquerors, have become absorbed in the surrounding French populations. Several appear to have even translated or modified their family names.

In any case no people in the world have better-established genealogies than the French Canadians. A learned archæologist has been able to trace through two and a half centuries the family trees of the whole nation, consulting for the purpose some 800,000 civil and official documents.*

The surprising growth of the Franco Canadian population is attested by the decennial census. But this population has had a severe struggle to maintain its

Fig. 125.—INCREASE OF ENGLISH AND FRENCH SPEAKING POPULATIONS IN THE DOMINION.



nationality and language amid the surrounding hostile elements. Even the British authorities, with every desire to conciliate, have at times yielded to racial prejudice, as in 1806, when they arrested on a charge of high treason the editors of a journal entitled, "Our Institutions, our Language, and our Laws." Public offices were almost exclusively entrusted to the English and to them alone were distributed the State lands, to the extent of 3,000,000 acres between 1793 and 1811. These and other grievances at last became so intolerable, that a revolt broke out, and was not quelled without much bloodshed, public executions, and wholesale proscriptions. In 1840 French was abolished as a legal and parliamentary language, but this measure was revoked nine years afterwards, when the Canadians of the Lower St. Lawrence definitely secured their constitutional rights.

Beyond this province the vast region stretching west of the Ottawa River has

* Cyprien Tanguay, *Dictionnaire généalogique des familles canadiennes*.

been mainly settled by English-speaking colonists. After the conquest the British Government actively promoted emigration in this direction, and the conclusion of the American War of Independence was followed by the arrival of numerous British "loyalists," who received liberal concessions of lands in the Upper St. Lawrence basin. In 1784 as many as 15,000 English, about an eighth of the whole population, had already settled in Canada, and after the wars of the Empire their numbers were so rapidly increased by direct immigration from Great Britain that about 1848 an equilibrium had been established between the two races. Then this equilibrium was immediately disturbed to the advantage of the English element owing to the exodus from Ireland consequent on the terrible famine of 1846.

Other immigrants, such as Germans and Scandinavians, also tend to increase the British element, for they naturally acquire the dominant language, and thus become rapidly absorbed in the Anglo-Saxon world. During the last decades the Scandinavian immigration has acquired a steadily increasing importance. Hence the French Canadians cannot hope to keep pace with, much less to counterbalance, the English speaking populations throughout the vast expanse of the Confederation. Whatever progress they may themselves make, the relative proportion of the two nationalities must be modified from year to year, always to the advantage of their British rivals.

FRENCH CANADIANS.

But the Franco-Canadians have at all events succeeded in definitely establishing their predominance in the region originally settled by their forefathers. Even the city of Quebec, which the English converted into a second "Gibraltar," peopling it with British soldiers and functionaries, has completely recovered its French nationality. Montreal, also, which Anglo-Saxon energy, favoured by its natural position, has made the industrial and commercial centre of the Confederation, is resuming the Franco-Canadian character, which had almost disappeared. At present these two cities, by far the most important in the province of Quebec, have become the strongholds of French-Canadian nationality.

Not only have the old French colonies remained the patrimony of the race, but the adjacent lands have also been gradually annexed. Thus several English, Scotch, and Irish colonies settled round about Montreal and along the banks of the St. Lawrence are now exclusively occupied by the Franco-Canadians, who have successively bought up all the lands. The East Counties, a British district created by the Government between French Canada and the United States in order to prevent all political alliances between the conterminous populations, are being slowly encroached upon by the French-speaking peasantry.

Nay, more! At the time of the division of Canada into the two provinces now bearing the names of Quebec and Ontario, great care was taken by the Government to group the populations in accordance with their respective ethnical origins. The eastern districts of the upper provinces were at that date un-

doubtedly English, containing only a few isolated French groups. Now, however, these counties contain over 22 per cent. of the French element, an increase of nearly 10 per cent. in the decade ending in 1881.

The Canadian peasantry, less enterprising but more thrifty than their Anglo-Saxon rivals, seize every opportunity of acquiring the mortgaged lands beyond the Ottawa. They pay cash down, and when they grow too numerous the English, disliking this foreign invasion, leave the district and migrate further west. In the course of a single generation, several Anglo-Saxon villages have thus been completely denationalised. On the other hand, the small Canadian colonies settled in Ontario before the arrival of the British immigrants have not only held their ground, but have enlarged their borders. Such is the group on the east side of the Detroit River, where the French population increased from less than 5,000 in 1851 to over 14,500 in 1881. Such, also, the Nottawasaga enclave on Lake Huron.

It is especially noteworthy that the Franco-Canadian settlements no longer consist, as formerly, of two long streets close to the banks of the St. Lawrence, but are also distributed some distance inland. Every town becomes a converging centre for the rural populations, and their domain thus becomes enlarged and consolidated. It will be increased threefold by the occupation of the upper affluents already begun about Lake St. John, and the Canadians hope that the clearance of the northern woodlands as far as the Height of Land, and even beyond it to Hudson Bay, will be effected by men of their race, and to their advantage. They expect one day to colonise all the territory traversed by the Pacific Railway north of the great lakes, and thus to join hands with their kinsmen in Manitoba, as they have already done through the Gaspé peninsula with the Acadians of New Brunswick and Nova Scotia.

But it is a far cry from the sources of the Ottawa to those of the Winnipeg. The intervening arable lands are scarce, and a portion of them has already been occupied by some formidable competitors, especially the Scandinavian settlers. Anyhow the French Canadians have great confidence in the future of their race. They are animated by a buoyant spirit which promises to carry them triumphantly over all obstacles. Having successfully withstood so many trials which might well have proved fatal to their national aspirations, they fancy themselves destined always to overcome adverse fate. They apply to themselves the words addressed by one of the founders of Montreal to the first settlers: "You are as a grain of mustard seed, but you will increase until your branches overshadow the earth; your children shall fill the world."

At any rate their American domain will become densely peopled if the birth-rate is maintained at the same proportion as during the past hundred years. The "moral constraint" preached by Stuart Mill and other political economists has made no proselytes in Canada. Candidates for public office have been rejected by the electors for the crime of celibacy. All marry young, and the families are very numerous, averaging from five to six children. Happy parents are not seldom seen on holidays surrounded by as many as twenty sons and daughters, and

instances have been known of aged people leaving behind them a posterity of over five hundred living persons.

The population is normally doubled every twenty-eight years, and it would be effected even still more rapidly if the hygienic treatment of children were better understood. At present infant mortality is very high, although after the first years ailments become rare, and cases of longevity are more frequent than elsewhere. As many as twenty aged couples have been known to jointly celebrate their "golden wedding," and in certain years, notably 1888, not merely the relative but the absolute increase of the Franco-Canadian population has exceeded that of the mother country. At the same proportion the French inhabitants of Canada would actually exceed those of France before the close of the twentieth century.

But the natural growth of the Canadian population is greatly reduced by emigration. It is often remarked that, compared with the English and Germans, the French are a stay-at-home people. But however true such a statement may be for the French of Europe, it is totally inapplicable to those of the St. Lawrence basin. The French of the New World have on the contrary a dash of the nomad in their veins, and the terms "Canadian" and "voyageur" have almost become synonymous throughout the North-West territories. Descendants of adventurers who had not dreaded to cross the seas at a time when the difficulties and perils inseparable from the foundation of remote settlements were far greater than at present, the Franco-Canadians have inherited the spirit of adventure, and this spirit was increased by their manner of life during the early times of the colonisation. The struggles with the Red-skins, military or trading expeditions across rivers, lakes, and forests, encampments in the woods and prairies, accustomed the descendants of the first squatters to a wandering existence. The same tendency was encouraged by the method of cultivation adopted by the settlers in a region too vast to be occupied all at once. Each settler might be satisfied with the plot of land granted to the first colonists, but his children expected to receive similar allotments for themselves. If the circumstances were favourable they built their log-huts near that of their father; otherwise, they moved farther afield in search of good arable lands.

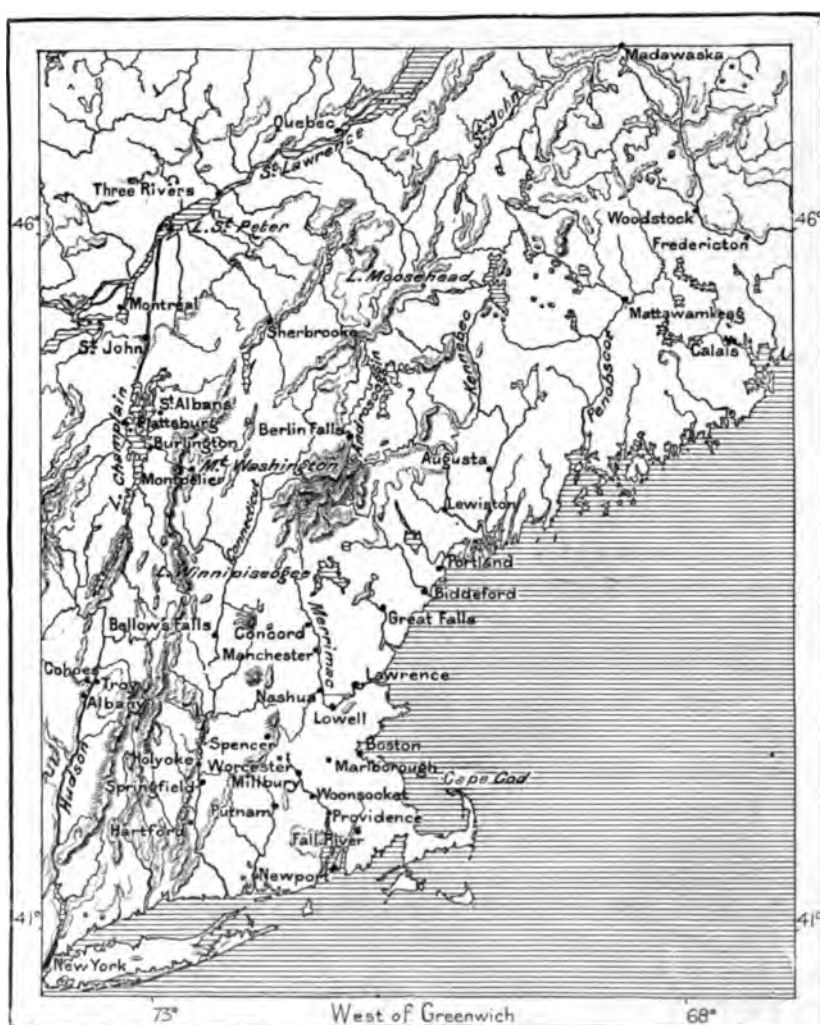
Thus the movement of colonisation advanced westwards along both banks of the river, and then inland up the valleys of the tributary streams. Such was the need of expansion that many of the settlers even moved northwards, removing from a comparatively mild to a far more rigorous climate. Nevertheless, the chief stream of migration was directed southwards, and a large number of Canadians following in the footsteps of their forefathers, the discoverers of Louisiana, crossed the Great Lakes to found new settlements on the plains of Illinois. But a still more copious stream set in the direction of the conterminous lands, that is, to New York and the New England states. The industrial towns of this region attracted the youth of both sexes, who during prosperous manufacturing seasons received good wages, enabling many young women to save enough for a respectable dowry, and even to live in comfort on their return to their homes.

Thus many places in Maine, Vermont, New Hampshire, especially Burlington, Concord, Manchester, Nashua, besides the chief cities in Massachusetts, Rhode Island, and Connecticut, received numerous Franco-Canadian colonists, and all these places have a separate quarter known as "Little Canada."

It is impossible to indicate the exact number of these Canadian immigrants

Fig. 126.—CHIEF CENTRES OF FRENCH-CANADIAN IMMIGRATION IN NEW ENGLAND.

Scale 1 : 6,000,000.



according to birth or descent, as the United States census returns regard as American citizens all those who are born within the territory of the republic without discriminating between those of English and French origin. But most statisticians estimate at not less than 600,000 the number of Canadians of French speech resident in the States, or more than one-fourth of the whole of the Franco-Canadian population. According to the Roman Catholic diocesan statistics

326,000 French Canadians were residing in the New England states alone in the year 1884, and those settled in other parts of the northern states between New York and Chicago may perhaps be estimated at about the same number.

But opinions vary as to the proportion of these emigrants who ultimately return to their Canadian homes. A certain number merely cross the frontiers in search of employment, returning as soon as they have earned enough to set up for themselves. But the majority settle permanently in the States, and thousands of Canadian families have already Anglicised their names.

Formerly, these Canadian settlers, mostly ignorant aliens lost amid populations differing in language, religion, and usages, formed an insignificant section of the community; yet comparatively few lost their distinctive personality, the majority keeping aloof, grouped round the chapel and the school where the national speech was preserved. Now they have become strong enough in several places to form independent political parties, hold annual assemblies, found "institutes," publish periodicals, combine together in vindication of a nationality which was supposed to have been absorbed in the surrounding Anglo-Saxon world. In Massachusetts, over two-thirds of the adults refuse to become naturalised Americans, and in the north-eastern states there already exists a "Canadian question." Is the Latin element supplied by Canadian immigration destined to be assimilated like all the other foreign ingredients introduced from Europe? South of the frontier some districts have, on the contrary, already become "Frenchified." In Maine and New Hampshire the total population decreases, while the Canadian element increases mainly through the natural excess of births over the mortality.

This great outflow towards the States is regarded by the patriotic party as a calamity because it tends to diminish the cohesion of the race. A large portion of the emigrants appear to have lost their nationality altogether, as it is feared that in the struggle for existence the Franco-Canadian exiles may, sooner or later, merely add strength to their rivals. But on the other hand the growing facilities of inter-communication may have the effect of enabling Canadian families to maintain their rapid increase, and thus preserve a numerical preponderance in the districts occupied by them.

Although the modifications caused by climate and change of life have not yet been carefully studied, it appears certain that on the whole the French race has not degenerated in the Laurentian basin. It may even be said to have improved in physical strength, stature, and the power of resisting the attacks of disease. The average type seems to have scarcely changed, and the natives of Montreal or Quebec met in the streets of Paris present no peculiarities specially characteristic of their transatlantic origin. The women, however, are said to have, on the whole, acquired more regular and stronger, though somewhat coarser and less animated features than those of their French sisters. The Canadian is naturally light-hearted and eminently sociable. This is seen even in his dwelling, which is open to the outer world and furnished with the friendly verandah, where hosts and guests may be seen balancing themselves in their rocking-chairs.

Living in proximity to the "Bostonians," or "Yankees," the Franco-Canadians are not men to be easily duped, and from their ranks are chiefly recruited the members of the legal profession. But on the whole the two races conduct their respective affairs with about equal success, the English displaying more initiative, the French more method and less show. The latter have, however, the advantage of knowing both languages, all educated French-Canadians speaking English correctly, and even supplying some of the most brilliant orators to the Ottawa House of Parliament.

It might be feared that this circumstance might tend to corrupt the national speech, and reduce it to a kind of jargon full of English words and expressions. Such fears are not altogether chimerical, and the Canadian, like the French Anglomaniac, is often heard interlarding his conversation with all manner of English terms and idioms in season and out of season. But the tendency has been checked by a revival of better taste aided by the stings of the satirist. In other respects the language of the well educated is still that of the old country, preserving, however, a rich treasure of graphic words which have become obsolete in France. The pronunciation is everywhere much the same, except that *j* is often pronounced with a slight aspiration, as in Charente-Inférieure and Deux-Sèvres.

Canadian literature, comprising nearly 1,200 works and double that number of pamphlets, may be regarded as rich for a population which numbered less than 100,000 at the beginning of the present century. Some of the old French songs have been orally transmitted, but often so modified that it is not always easy to recognise their true origin. They have been adapted to the new surroundings, but the old poetic spirit still remains unimpaired. Every band of woodmen, every boat's crew has its special singers, often its improvisatori and poets, who, like the old ballad-makers, throw into verse the various incidents of their life.

Amongst her relatively numerous writers Canada also possesses some masters of style, and quite a school of local historians have revived the dramatic records of the past. Compared to their English fellow-citizens, the Franco-Canadians certainly excel in the importance of their historical and literary works, but are inferior in all branches of the applied sciences. The geological exploration of the Dominion, so brilliantly begun by the English naturalist, Logan, has since been prosecuted almost exclusively by others of English blood, natives either of Great Britain or of Canada, and even most of their fellow-workers in the various departments of natural history belong to the same race.

The great majority of the French Canadians are Roman Catholics. In 1765, soon after the British conquest, there were only 500 Protestants in a total population of 69,000; and it may be stated, in a general way, that at present the total number of Catholics returned by the census of 1881 corresponds pretty closely to that of the French and Irish elements, at least in the province of Quebec. Nationality and religion coincide almost everywhere in this province, where the influence of the clergy is so great that the few priests who become Protestants generally carry their congregations with them. At the Canadian national feast of

St. John the Baptist, religious ceremonies and civic demonstrations are curiously intermingled, and the very name of Jean-Baptiste, like Patrick or Paddy in Ireland, is used in ordinary language as synonymous with French Canadian. All "perverts" to Protestantism are regarded as also traitors to their nationality, and generally become tabooed, so that most of them have to remove elsewhere.

In French Canada Freethinkers are not numerous, or at least they are not grouped in distinct circles, while as patriots they always side with their Catholic fellow-countrymen. Apart from them, all Franco-Canadians would seem to profess a simple faith not yet disturbed by the doubts of modern philosophy or scepticism.

The French clergy are generally regarded by the patriots as the mainstay of their nationality. Yet they would appear to have followed rather than led the movement. On all great occasions, where the higher interests of the British Government were at stake, the hierarchy has given proof of the most devoted loyalty. It also frequently happens that in mixed parishes, where the Irish and French disagree in the choice of a pastor, the Irish carry the day and English becomes the official religious language. With few exceptions the Canadian clergy show themselves hostile to modern France, the "Land of the Revolution." They delight to celebrate the France of the old monarchy, and their flag would still be the white standard of the fleur-de-lis, the flag raised by the French half-breeds when they revolted in Manitoba.

TOPOGRAPHY.

Nearly the whole of the population of the Laurentian basin is concentrated in the peninsular space comprised between Lakes Huron, Erie, and Ontario, and along the banks of the Ottawa and of the St. Lawrence as far as Quebec. Beyond these regions the land is very thinly peopled and contains scarcely any places of importance. Towards the west especially the province of Ontario is almost uninhabited.

In this direction the administration extends far beyond the natural limits of the Laurentian basin. The outlying stations lie on the frontiers of Manitoba within the Lake Winnipeg basin, and, by a curious contradiction, the capital of this district is *Keewatin*, formerly capital of the district of the same name, which stretches away to the northern solitudes far beyond the jurisdiction of Ontario. Keewatin, which was at one time called the Portage du Rat by the Canadian trappers, lies on the Pacific Railway at the point where the Winnipeg River escapes from the Lake of the Woods.

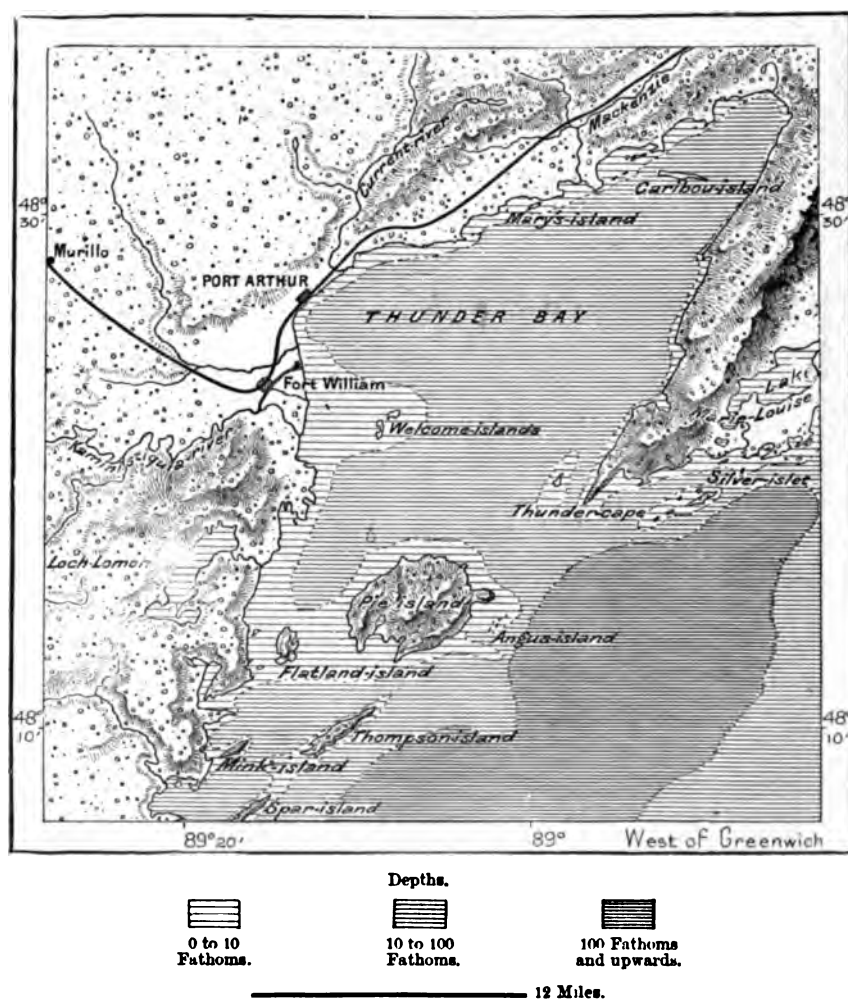
The same great trunk line possesses two ports on Lake Superior, *Fort William*, on the west side of Thunder Bay at the mouth of the Kaministiquia, formerly a fortified post of the Hudson Bay Company; and *Port Arthur*, or *Arthur Landing* on a deep bay about six miles farther north. Both are rising places, probably destined to merge in one vast city as a great outlet for the agricultural produce of the Far West. They have already their grain elevators, warehouses, and steamers, plying on the lake and affording water communication with the American cities of

Duluth, Milwaukee, and Chicago. Port Arthur, the larger of the two, and the most important place on the railway between Winnipeg and Ottawa, is complacently called by its inhabitants the "Future Chicago" of Canada.

The dioritic rock of *Silver Islet*, at the extremity of Thunder Cape, which encloses Thunder Bay on the east side, has become famous in the mining records

Fig. 127.—THUNDER BAY.

Scale 1 : 550,000.



of Canada. Its valuable argentiferous lode, discovered in 1868, yielded in the ten years from 1870 to 1879 a total sum of £630,000.

Since then, *Bulger* and several other very productive mines in the Thunder Bay district have been discovered and surveyed. Crushing mills, saw mills, and other industrial establishments, mostly belonging to American citizens, have sprung up below the great *Kakabeka* Falls, the "Niagara" of the Canadian West.

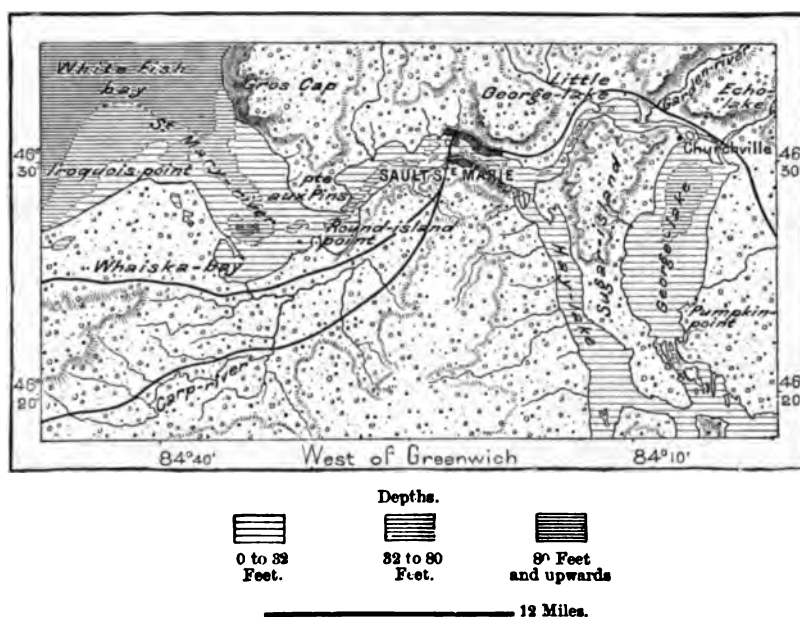
The ancient post of *Sainte-Marie*, round which were formerly grouped the huts

of the Saulteux Indians, is also a rising place, and will certainly become one of the great industrial centres of the continent. The Canadian village lies on the rapids over against the American town of Sault, and both localities bear the same name. Sault Sainte-Marie is already an important centre of inland navigation, thanks to the canal constructed in 1855 on the American side, which is utilised by craft of all kinds with a collective annual capacity of about 6,000,000 tons. At an islet on the British side the engineers have begun the construction of a second larger and deeper canal, which will also supply water-power for the Canadian factories. The "Sault" is, moreover, an international station of the first importance on the railway connecting St. Paul and Minneapolis with Montreal.

In anticipation of the future agricultural development of this lake region, the

Fig. 128.—SAULT SAINTE-MARIE.

Scale 1 : 600,000.



Pacific Railway Company has here founded the station of *Algoma Mills*, so named from the surrounding territory of Algoma, "land of the Algonquins." It stands on a deep and well-sheltered harbour on North Channel, in a central position for the converging lines of navigation on Lakes Superior, Michigan, and Huron. Facing it is the large island of *Manitoulin*, which, till 1870, was a territory reserved for the Ottawa and Saulteux Indians; but the white settlers have invaded this, as they have so many other reserves, and now they far outnumber the natives.

A few ports, whose future depends on the progress of inland colonisation, follow east and south-eastwards along the shores of Georgian Bay. From *Parry Sound* is forwarded the produce of the Muskoka district, partly colonised by civilised Indians from the east. *Penetanguishene*, "Moving Sands," and *Collingwood*, towards the southern extremity of the bay, are the nearest ports to *Barrie*, *Orillia*,



LAKE HURON—VIEW TAKEN FROM FRENCH RIVER.

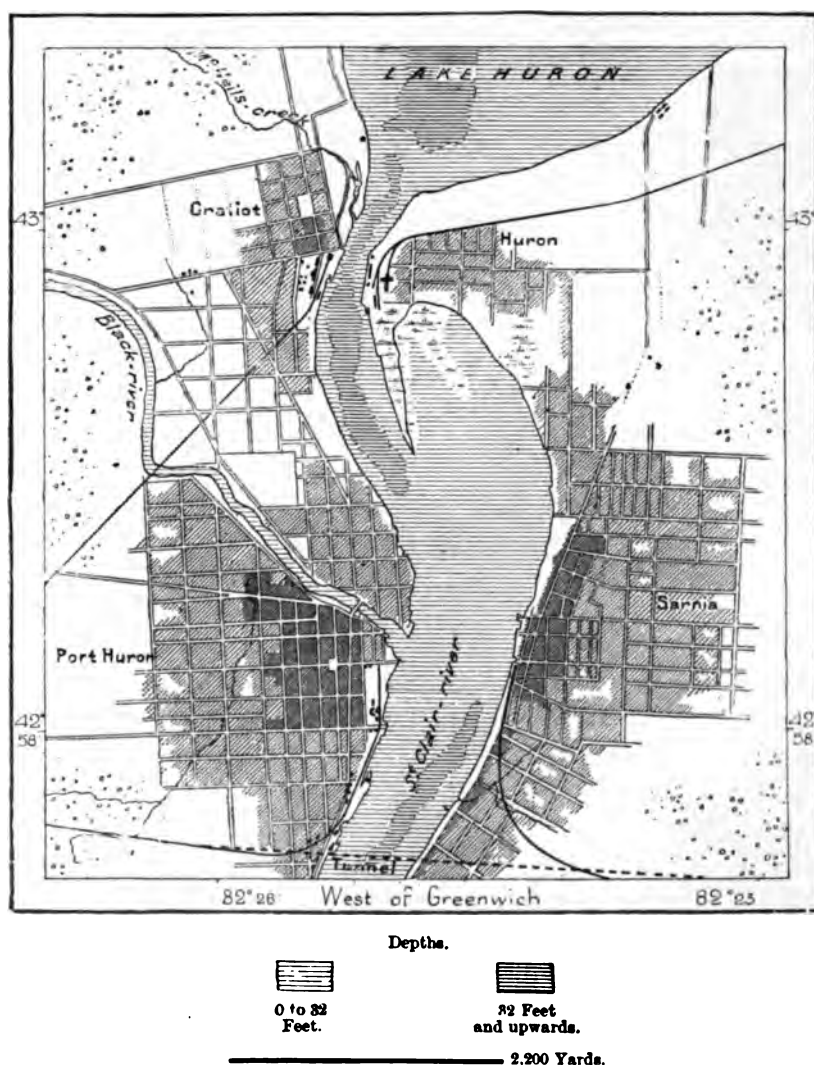


and the romantic shores of Lake Simcoe. In the neighbourhood are the French-Canadian colonies of *Nottawasaga*, inhabited by descendants of trappers settled here since the last century. In the same district has also been founded an establishment of Russian Mennonites.

On Lake Huron the most frequented Canadian port is *Owen Sound*, now con-

Fig. 129.—PORT HURON AND SARNIA.

Scale 1 : 58,000.



nected with *Sydenham* at the extremity of an inlet near the neck of Indian Peninsula. It is the best harbour on the lake, with water at its quays deep enough for the largest vessels. Thanks to the railways, Owen Sound has become the port of Toronto for all produce coming from the north-west.

The other ports, such as *Southampton*, *Port Elgin*, *Kincardine*, and *Goderich*, are all shallow and badly sheltered. Six banks of native salt, discovered at a depth

of 980 feet in the neighbourhood of Kincardine and Goderich, supply some twenty factories in the district. They have a total thickness of 130 feet.

Sarnia, on the east bank of the St. Clair River at the outlet of Lake Huron, practically forms a single city with the American town of Port Huron on the opposite side. The converging lines of railway are connected by steam ferries, and in 1891 a subway 2,000 yards long will be opened between the two places. This passage runs at a depth of 75 feet below the ground, and of the total length about 800 yards lie beneath the river.

Except *Wallaceburg*, which stands on a lateral channel of Lake St. Clair, all the other towns and villages along the St. Clair River are twins. Thus the large city of Detroit, metropolis of the State of Michigan, is supplemented on the Canadian side by *Windsor*, capital of Essex County, at the southern extremity of the peninsular section of Ontario.

The Big Bear River, one of the affluents of Lake St. Clair, traverses a highly productive district, which is being rapidly developed, especially since the petroleum wells of the United States have shown signs of exhaustion. In the Big Bear basin also occur oil reservoirs, which have already been tapped, as at *Petrolia* and other places.

Besides its mineral wealth this basin has great agricultural resources, though in this respect inferior to the valley of the Thames. This river, the *Tranche* or *Tranchée* of the early French explorers, also discharges into Lake St. Clair, its course following an old coastline of Lake Erie. In this district *Stratford* and *Woodstock* are thriving agricultural centres, while *London*, the capital, accepts its name quite seriously. Its streets, squares, and public buildings have been named from the corresponding quarters and monuments of the English metropolis, and one of the governors of Canada wanted to make it the capital of the colony. Surrounded by the best-cultivated fields and gardens in the province of Ontario, London is also proud of its industrial activity, and possesses several large educational establishments. Its valuable sulphur springs even make it a watering-place, while the neighbouring town of *Ingersoll* has become the chief centre of the cheese industry in Ontario.

London is connected with Lake Erie through the flourishing town of *St. Thomas*, another railway centre, where large rolling-stock works have been established. *Port Stanley*, on an inlet of Lake Erie, is the outport both of London and St. Thomas. South-westwards, the alluvial lands traversed by the Thames before entering Lake St. Clair have earned the name of the "Garden of Ontario." *Chatham*, the central market, was the chief refuge of runaways in the days of slavery. Here are settled as many as 2,000 of their descendants, nearly a fourth of the whole population, while they number 1,500 at *Windsor*, where they are as numerous as the French Canadians.

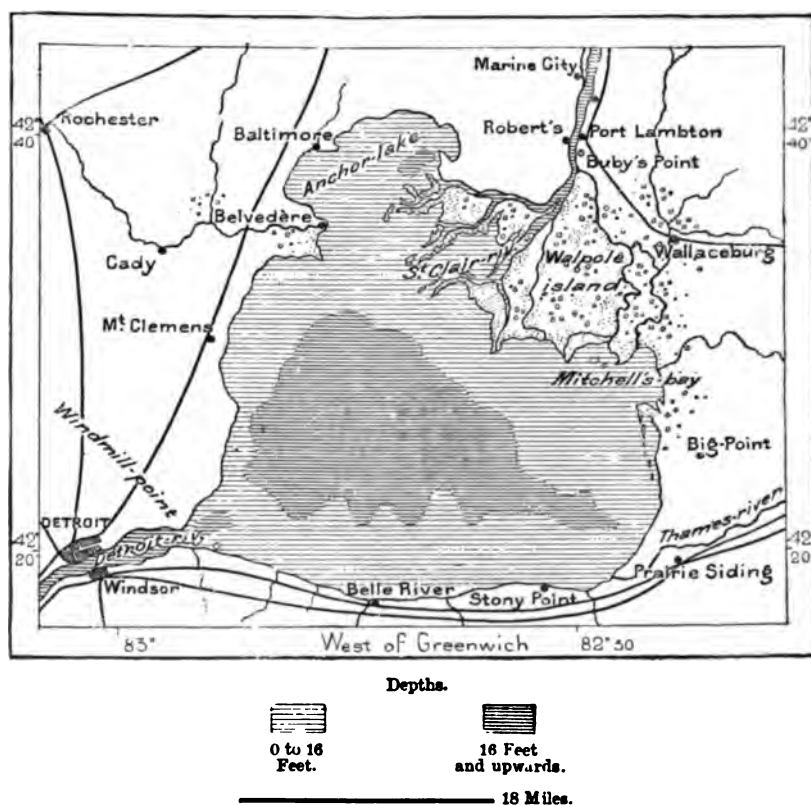
The basin of the Grand River, which flows southwards through the eastern parts of the lacustrine peninsula, rivals the Thames valley in the density of its population. In its upper valley is found the largest German settlement in Canada, consisting chiefly of Mennonite and Lutheran communities grouped round

about Berlin, capital of the district, and at Hamburg, Strassburg, and other places bearing German names. But although these colonies have founded German schools for their children, English is already the dominant language in the district, as it is everywhere throughout the province of Ontario.

Guelph, the largest town in the Grand River basin, is altogether English, as is also *Galt*, which lies farther south. *Brantford*, so named in honour of the famous Iroquois chief, Brant, is Anglo-Saxon, if not in the origin of its inhabitants, at any rate in its language and usages. The Iroquois of the country, settled round the council hall of the Six Nations, at the borough of *Tuscarora*, are

Fig. 130.—LAKE ST. CLAIR.

Scale 1 : 900,000.



amongst the most loyal subjects of the Queen of England. One of their schools, the Mohawk Institute, is quite a model establishment, such as is rarely found even amongst white populations.

Between Galt and Brantford is situated the only town named from the French capital; but even this *Paris* lies within the pale of British colonisation, and its name is due to the deposits of gypsum (plaster of Paris) found in the vicinity. By a curious coincidence the artistic objects produced by the skilled artisans of this place more closely resemble the products of Parisian industry than any others.

East of the peninsula the fluvial valley of the Niagara River is traversed in its entire length by the Welland Canal, which forms the connecting link between the lines of navigation on Lakes Erie and Ontario. The towns of this district are even better known than those of the Grand and Thames valleys, thanks to the numerous strangers who come to visit the Falls during the season. At the southern entrance of the Niagara River, *Port Erie* stands over against the American city of Buffalo. A little farther on *Victoria* corresponds to the suburb of Buffalo, where the river has been bridged by the railway viaduct.

Below the Falls, the Canadian side has also its little settlement, which is connected with the American town of *Niagara Falls* by the famous suspension bridge 1,270 feet long, which was blown down during the terrific blizzard of 1888

Fig. 131.—MOST DENSELY PEOPLED REGION IN ONTARIO.

Scale 1 : 2,500,000.



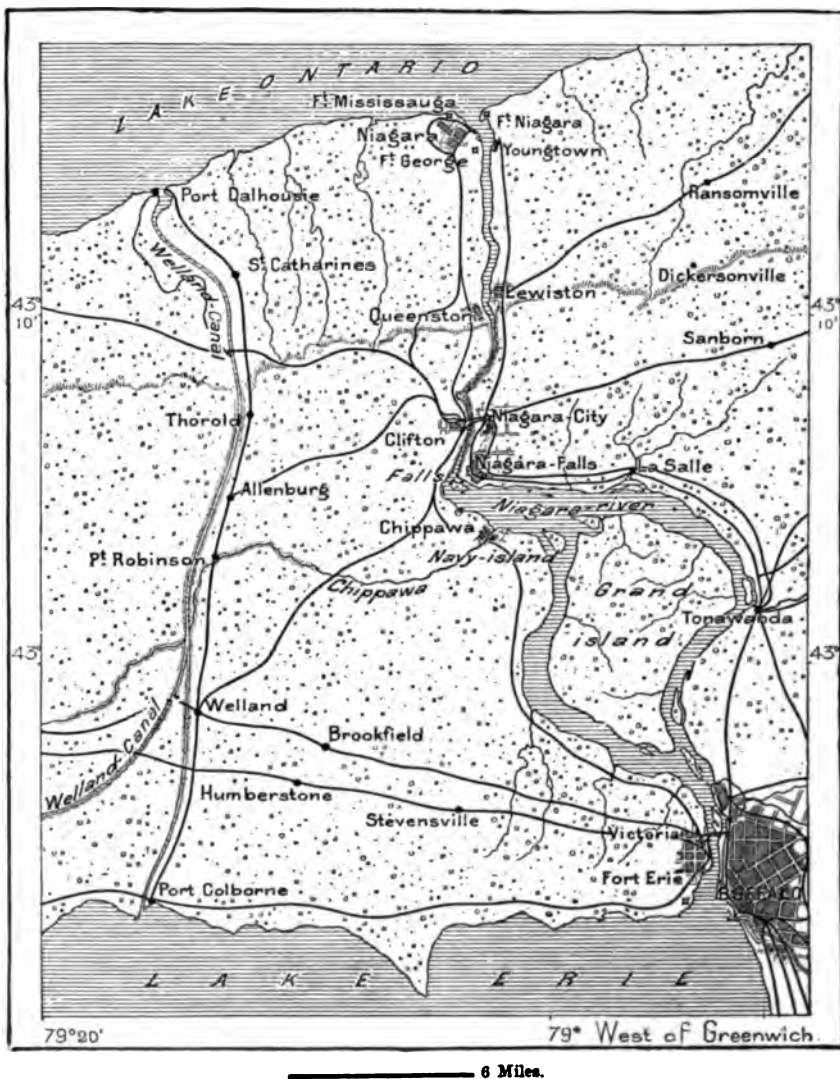
and immediately afterwards re-erected. *Clifton*, about two miles lower down, is similarly connected with the opposite town of *Niagara City* by an international bridge shorter but higher than that above the falls.

Queenston, at the northern extremity of the rapids, where the river enters smooth water, faces the American town of *Lewiston*. Lastly, at the point where the Niagara enters Lake Ontario, stands the town of *Niagara*, to which again corresponds *Youngtown* on the American side. *Niagara* is one of the oldest places in Ontario, having been founded under the name of *Newark* after the War of Independence by loyalist refugees from the States. It was the first capital of the province, and some incidents of the war are recalled by *Forts George* and *Niagara*, the former on the British, the latter on the American side of the estuary. Like the other towns of the Niagara valley, *Newark* at one time possessed some commercial importance, but most of the traffic has gravitated farther west to the *Welland Canal*, which is also lined with towns and villages from *Port*

Colborne at the Lake Erie entrance to *Port Dalhousie* on Lake Ontario. The chief town traversed by this navigable artery is *St. Catherine's*, a centre of workshops and warehouses, on which converge several railways. Unfortunately,

Fig. 132.—ISTHMUS OF NIAGARA.

Scale 1 : 400,000.



this place occupies a low-lying unhealthy position near the northern end of the channel.

HAMILTON—TORONTO—KINGSTON.

Hamilton, the third largest city in the province, stands on a much more favourable site near the west corner of Lake Ontario, on a canal connecting it with Burlington Bay, and in a cirque limited on the west side by the silurian escarpment which farther east has been pierced by the Niagara river. The

inhabitants of Hamilton give the name of "Mountain" to this steep cliff, in their eyes the *Mountain* in a superlative sense. It is traversed by a canal connecting Hamilton Bay with Dundas and the affluents of Lake Huron.

Hamilton is increasing rapidly, but notwithstanding its advantageous geographical position at the extremity of the natural highway connecting Lakes Ontario and Huron, it has already been far distanced by its eastern neighbour, *Toronto*, which possesses a better-developed railway system, radiating in all directions.

Toronto, capital of the province of Ontario, and "Queen of the West," occupies on Lake Ontario a sandy tract, which slopes gently northwards between the two rivers Don on the east and Humber on the west side. The town is regularly laid out, nearly all the streets intersecting each other at right angles and running either parallel or vertical with the lake, but the general effect is somewhat monotonous and commonplace. The view of the lake is masked by a slightly wooded tongue of land, which encloses the harbour, leaving an open channel on the west side 12 or 13 feet deep.

At first sight Toronto would not seem to enjoy any special natural advantages. It has no navigable river, nor is its port accessible to vessels of heavy draught. But it occupies a central position with respect to the fertile lands of the province of Ontario, and it lies directly opposite the highway opened by the Niagara valley towards Lake Erie and the United States. In former times the Indians from the north held their peltry sales on this spot, and it was for the purpose of controlling them and drawing a revenue from the trade that the French erected *Fort Rouille* in 1749 at the mouth of the river now known as the Humber.

This fort was abandoned when the present city was founded in 1794. It was at first called *York*, or *Little York*, and this continued to be its official name till the year 1834. The term "*Toronto*," which ultimately prevailed, and which means in Iroquois "Trees on the Water," was at first applied to the sandy spit off the harbour, and then to the whole district as far as Lake Simcoe and Georgian Bay. Its selection as the provincial capital added greatly to the natural advantages of the rising settlement, whose destinies were secured by the development of the railway system, which has its converging-point at Toronto.

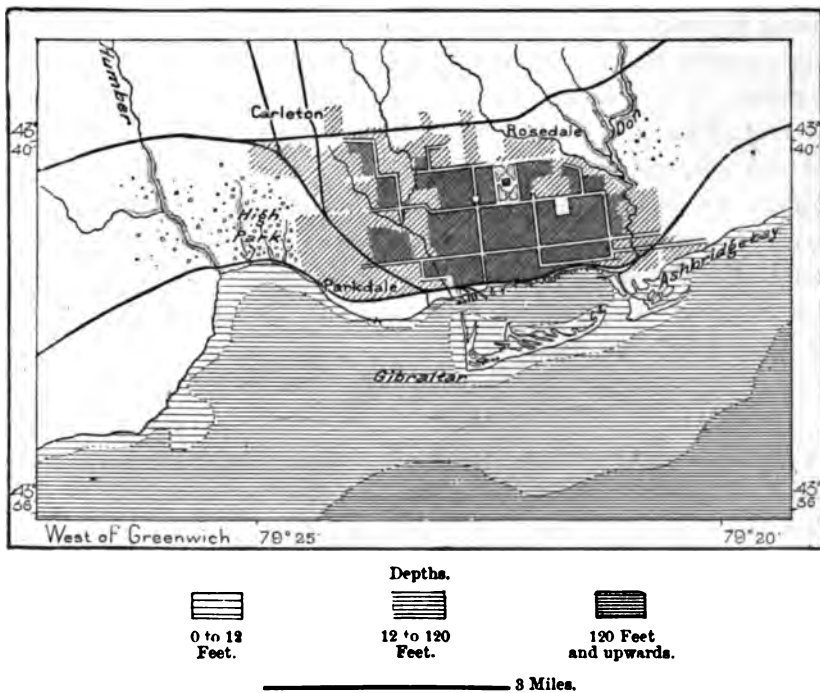
Since then the city has continued to progress at such a rapid rate that it hopes to equal or even outstrip Montreal before the end of the century. The population rose from 900 in 1813, and 9,000 in 1834, to over 86,000 in 1881, and nearly 180,000 with the suburbs in 1889! Montreal, however, has the immense advantage of direct communication with the Atlantic, besides commanding the great trade routes to the interior of the continent. On the other hand, Toronto lies in a relatively densely peopled district, and owing to the sandy soil, enjoys a better climate than its rival. The streets are wider and better shaded, and the average mortality much lower, 21·45 as compared with 27·91 per 1,000.

Perhaps the greater ethnical unity of its population may also be considered a point in its favour. The inhabitants being nearly all of English speech, are not

troubled by intestine rivalries and wranglings which prevent harmonious action for the common good. If the trade of Toronto is still inferior to that of Montreal, its literary and scientific activity is greater; its periodical press is better edited, and commands a wider circle of readers; its book trade also is brisker; and its high schools display greater educational vigour. The university, founded in 1827, but nearly destroyed by the disastrous fire of 1890, is the chief establishment of the kind in Canada. Its several libraries are open to the public, and its schools are amongst the finest monuments in the city. Several parks, both in the interior and neighbourhood, contribute to the general health of the place, and it is in their

Fig. 133.—TORONTO.

Scale 1 : 150,000.



vicinity or even beneath the shade of their groves that most of the scholastic establishments have been erected.

Eastwards follow a few little havens, such as *Whithy*, *Oshawa* (the "Portage"), a busy manufacturing place, *Port Hope*, pleasantly situated, and surrounded by dockyards, *Cobourg*, with numerous fine residences, extensive parks, and shady thoroughfares. Cobourg is also a university town, whose faculties are completed by an Academy of Medicine founded at Montreal by the Wesleyan Church.

Farther east, *Bellefille*, which has also a large college with the title of university, lies at the mouth of the river Moira, on the winding Bay of Quinté. Its port communicates in two directions with Lake Ontario, eastwards, through a natural channel which meanders between the islands and headlands, and which

sends its ramifications towards the two industrial towns of *Deseronto* and *Napanee*; westwards by a canal free of locks, but only 12 feet deep, cut through the neck of Prince Edward Peninsula near the important town of *Trenton*, where are the largest paper-mills in Canada.

North-west of Belleville lies the thriving town of *Peterboro*, surrounded by a labyrinth of lakes, which also drain to the Bay of Quinté, formerly Kintsio. The Otonabee river, which flows by Peterboro, carries the overflow of Stony Lake to Rise Lake through a series of falls and rapids which are utilised to drive the wheels of numerous factories. Like its western neighbour, *Lindsay*, Peterboro is a converging-point for several of the Ontario railway lines. It is also proposed to make it the centre of the navigable canals intended to connect the various ports of Lake Ontario with those of Lake Huron. It is also proposed to construct a ship railway between the two lakes.

Kingston, at the eastern extremity of Lake Ontario, has recently become a busy trading place, and is now the chief inland port between Toronto and Montreal. So early as the year 1673 the French had already perceived the strategic importance of this site, and 400 men had here erected the fortress of *Cataraqui* or *Cataracoui*, so named from the river which reaches the St. Lawrence at this point. But the outlying station was, so to say, lost in the midst of the Iroquois populations, and its garrison had to be withdrawn. Frontenac rebuilt the fort in 1695, and since that time *Fort Frontenac*, now Kingston, has continued to be the chief military town in Upper Canada.

Kingston is still fortified and armed with batteries and the Dominion here maintains a military establishment, from which are recruited the staff and engineering corps. This school takes rank with the training colleges of Great Britain, its best pupils receiving commissions in the English army.

Before the administration was removed to Toronto, Kingston was the capital of Upper Canada, and even for the three years from 1841 to 1844, during the period of the open struggle between the British Government and the French Canadians, it served as the chief centre of authority in the province of Ontario, where, besides Niagara, it is at present the only fortified town. Its importance, however, is mainly due to its military college, its Presbyterian "university," its medical schools, and its lumber and grain trade. Through a narrow cutting in a rocky sill the lakes drained by the Cataraqui communicate with those which discharge through the Rideau, thus connecting Kingston with Ottawa, capital of the Dominion.

At Kingston the St. Lawrence, from the first a mighty stream, begins to ramify into a thousand channels between the "Thousand Islands." The village of *Gananoque* on the left bank of the river is lost amid this labyrinth of waters. But the busy town of *Brockville* over against Morristown on the American side lies on one of the "narrows" where the whole stream is pent up in a single channel.

Lower down follows *Prescott*, which may be regarded as a mere suburb of the American town of Ogdensburg, the chief port of the State of New York on the

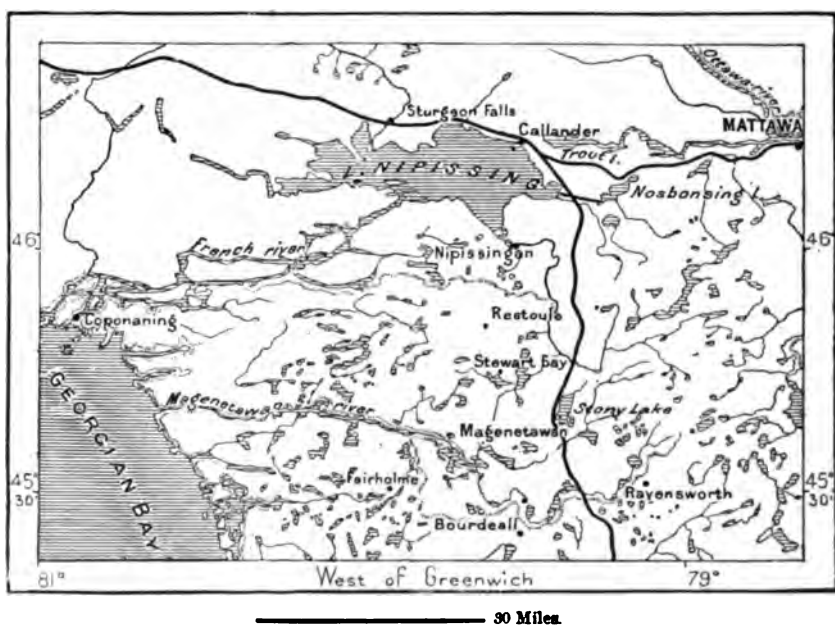
St. Lawrence, but lying in a district partly colonised by French Canadians. Ogdensburg was formerly the Fort Presentation of the French settlers.

Below the Long Sault, a formidable chain of rapids turned on the north side by a canal 12 miles long, stands the manufacturing town of *Cornwall*, which marks the point where the St. Lawrence begins to flow entirely through Canadian territory. Works are now in progress by which the canal will acquire a uniform depth of from 14 to 16 feet. The American frontier, which here strikes inland, intersects the town of *Saint-Regis*, occupied by a community of civilised Iroquois Indians.

Just below this point the river ramifies into several branches round about Grand Island and a whole cluster of islets, which serve as the foundations for the

Fig. 134.—LAKE NIPISSING.

Scale 1 : 1,700,000.



supports of a viaduct thrown across the stream from *Coteau Landing* to *Valleyfield*. Over this bridge, 3,000 yards long, is carried the railway running from Ottawa directly to New York. Beyond Grand Island a strait flowing between two wooded headlands leads at once to the vast basin formed by the confluence of the St. Lawrence with the Ottawa.

The Ottawa itself rises too far to the north beyond the Height of Land for its northern valley to contain any important centres of population. Nearly the whole of this vast region is still a mere waste of rocks and woodlands, and hitherto the white colonists have reached no farther than the shores of Lake Temiscaming. Even this young settlement lies, so to say, in the wilderness, a day's journey by water and portages north of *Mattawa*, whence it draws its supplies. *Mattawa*, that is, "Confluence," is conveniently situated on the right bank of the Ottawa

and of its tributary, the Mattawan, in a district containing auriferous deposits. Till recently an obscure station of the Hudson Bay Company, it has now acquired some importance as one of the chief stations on the transcontinental railway, and as a centre of distribution in the northern part of the province of Ontario. But Mattawa still presents a very modest appearance, with its little houses scattered amid the surrounding boulders which give to the plain the aspect of a giants' cemetery.

The lumber sent down from the upper Ottawa and from the Mattawan meets at this place, and partly supplies the local sawmills. A speculator has also succeeded in making Mattawa the depôt for the timber from Lake Nipissing and from Georgian Bay despite the waterparting between these basins and that of the Ottawa. A steam-engine on a hill commanding the eastern inlet of Lake Nipissing raises the logs by means of an endless chain, and transfers them to another lake which drains to the Mattawan.

South and south-east of Lake Nipissing the Government still possesses from ten to twelve million acres of land, which was till recently uninhabited, but a considerable portion of which is studded with lakes and is quite capable of cultivation. These lands are given gratuitously in lots of 100 acres to any settlers who undertake to build a house, reside on the land, and cultivate it.

The colonisation of this region, formerly supposed to be unproductive, began in 1878, and a few villages have already sprung up in several districts. The Pacific Railway skirting the north side of Lake Nipissing is gradually transforming its little wayside stations into agricultural and trading centres, where the Canadian population predominates. *Sudbury*, the chief town in the district, lies in a country abounding in copper, iron, and nickel mines. *Callendar*, near Lake Nipissing, occupies a convenient position on the lake and near the converging-point of the railways.

OTTAWA.

Pembroke, *Arnprior*, *Aylmer*, and other places on the Ottawa below Mattawa, have acquired some trade, thanks to their position near the rapids, where passengers, goods, and rafts are obliged to stop, and where the necessary water-power is obtained to work the sawmills. *Ottawa* itself, formerly *Bytown*, would have remained a mere lumber village, had not the Queen of England been induced to select it as the capital of the Dominion. In 1800 a daring pioneer from Massachusetts settled here with a few companions, and began to clear the land; but no lumber was floated down the watercourses to Quebec before the year 1806. In 1831 a village of 1,000 inhabitants, nearly all Americans or Scotch, had already sprung up at the Ottawa Falls, and soon after the canal was completed which connects the Ottawa with the St. Lawrence and Lake Ontario through the course of the Rideau and the chain of lakes traversed by the Cataract. This great hydraulic work had been carried out mainly for strategic purposes, in order to facilitate the transport of troops and supplies between the Lower St. Lawrence and Lake Ontario, in case the Americans should seize the channels at the Thousand



OTTAWA--VIEW TAKEN FROM PARLIAMENT TERRACE.



Islands. Fortunately it has hitherto been used exclusively for the development of trade, and it has tended greatly to increase the value of the Ottawa sawmills.

In 1858 the rising town of Ottawa was chosen as the capital of the confederacy, and the first parliament was here assembled in 1865; since then the neighbouring villages of *New Edinburgh* and *Rochesterville* have been annexed to the growing metropolis, which, thanks to the political and administrative concentration, has already become the fifth largest city of the Dominion. It is exceeded in population only by Montreal, Toronto, Quebec, and St. John, and it hopes in course of time to surpass all its rivals.

Ottawa is admirably situated on a rocky plateau, which commands the right bank of the Ottawa below the so-called Chaudière Falls. Its suburbs extend westwards above the rapids and eastwards beyond the Rideau River, while on the opposite side, consequently within the province of Quebec, the flanks of the escarpment are occupied by the industrial town of *Mill*. The eyots and ledges skirting both sides of the falls and rapids are already covered with workshops, sawmills, depôts, and numerous wood houses. But despite all these unsightly structures the falls which gave rise to the city of Ottawa still present a superb picture. The stream, which higher up expands to a width of over 1,600 feet winding between numerous poplar-clad islets, suddenly contracts towards a rocky chasm scarcely 200 feet broad, and plunges into a boiling "cauldron," whence it escapes in a long foamy current expanding into a tranquil basin opposite the city. Here also the Ottawa is joined by the Rideau tumbling over a cascade 60 feet high, and developing a perfectly regular white *rideau* or "curtain" in front of the limestone cliff. But this cataract also, formerly one of the most romantic in Canada, has been disfigured by the mean walls of workshops.

The Ottawa lumber industry is the largest in Canada, and special machinery has here been erected for converting the logs into planks, battens, tubs, buckets, matches, and a thousand other objects. Hundreds of steam saws are kept going night and day; the surface disappears at many points beneath the rafts moored to the banks, and the waters of the inlets and even of the whirlpools are strewn with thick layers of sawdust. But these layers get gradually saturated and then sink to the bottom, where they accumulate to such an extent that in certain cavities of the river the depth has been diminished by 40 or 50 feet. Then the accumulated masses begin to ferment, and in winter when the stream is frozen over the gases escaping from below are at times strong enough to burst through the ice with an explosion like that of a volcanic eruption.*

The Houses of Parliament have been erected in the finest part of the city on the terrace projecting eastwards to the Rideau Canal, which has here been cut to a depth of 160 feet in the live rock. The buildings, in the Lombard Gothic style, are disposed in three groups round about an extensive grassy lawn, the greyish sandstone blocks being relieved by copings of pink limestone and marble, which produces a pleasant effect. Lofty towers of varied form, some extremely picturesque, rise to a considerable height above the roofs, and this majestic pile is

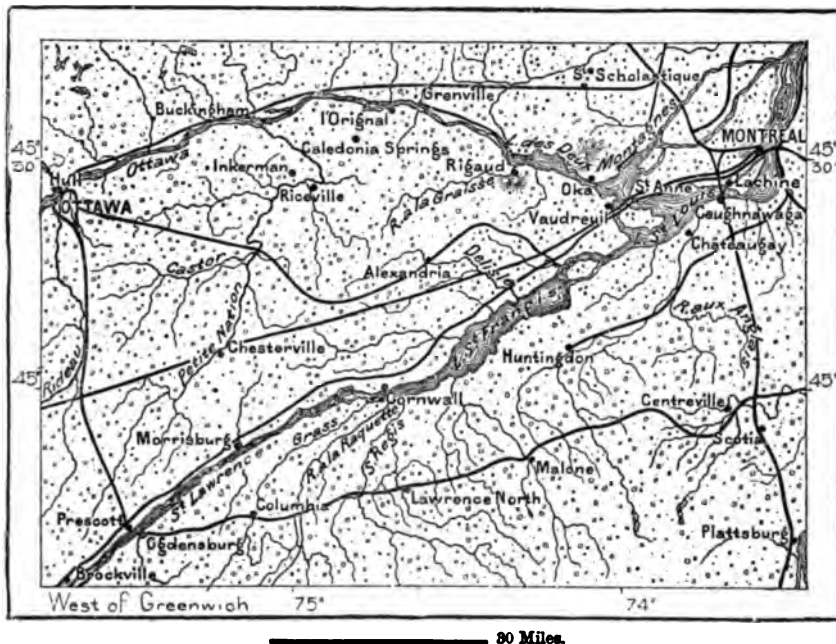
* Benjamin Sulte; Sandford Fleming, &c.

altogether the most sumptuous monument in the Dominion. But its chief beauty is due to the magnificent panorama stretching round the rocky terrace, whence the eye sweeps over the distant chain of the wooded Laurentian hills, and the sparkling waters of the river with its tranquil bays, lakes, whirlpools, and foaming cataracts.

An extremely graceful rotunda standing at the extremity of the terrace behind the chief building contains the library, which already numbers over 100,000 volumes, besides pamphlets and periodicals. This is the most important collection in the State, and it is growing so rapidly that it will soon have to be removed to

Fig. 135.—FROM OTTAWA TO MONTREAL.

Scale 1 : 1,800,000.



larger premises. The most valued section, specially devoted to the history of Canada, comprises about 8,000 works and a large number of manuscripts.

Ottawa also contains a valuable museum connected with the geological exploration of the Dominion. The petrographic and other documents, which reveal the gradual discovery of the boundless regions of British America, are here admirably classed; by their means the student may easily follow the track of the explorers, who go forth every year to thoroughly explore those districts of the North-West Territory and Pacific seaboard which are still known only by superficial surveys.

In the neighbourhood of Ottawa is another most useful institution, the school of agriculture, gardening and rural industries, with 500 acres of ground, where the study of the acclimatation of exotic plants is successfully carried on. In these experiments French seedlings are chiefly used. The Canadian capital has of

course also its university; which however, scarcely yet rivals those of Montreal, Quebec, and Toronto.

Although founded exclusively by English-speaking settlers, Ottawa, like Montreal, is now a double city as regards the nationality of its inhabitants. The French element forms doubtless but a small minority; but its relative proportion is increasing from year to year. Hull, on the opposite or Quebec side of the Ottawa, is entirely French, and the Franco-Canadians are already in a majority in some quarters of Ottawa itself; but from the aspect of their suburbs it is easily seen that they are for the most part poorer than the English. They are chiefly woodmen, lightermen, or factory hands living on their wages, and residing in wretched little wooden houses in dirty, badly-paved streets. But all quarters are at least supplied with an extraordinary abundance of good water. From the river above the falls Ottawa draws sufficient to furnish each person with ten times as much pure water as is thought necessary even in the best-administered European towns.

Ottawa has also become an important railway centre, and is already connected by three lines with Montreal. One of these is carried on a graceful steel bridge over the river above the falls, and almost immediately afterwards crosses the great river Gatineau, which every year floats down hundreds of thousands of logs for the sawmills of Ottawa. In 1889 a "jam" of 200,000 tree-trunks occurred at one of the narrows, threatening the plains lower down with a tremendous avalanche of a novel character. All the upper valley abounds in iron ores and in graphite. The rocks in the vicinity of the confluence, and especially in the outskirts of *Templeton*, are extremely rich in phosphates, which are at present for the most part exported, not being yet needed for the little land under tillage in the district itself.

Along its lower course the Ottawa is joined by a large number of rivers, and at almost every railway-station the line crosses some affluent blocked with rafts floated down for the factories on the lower reaches of the main stream. *Buckingham*, on the copious Hare River, has a crowded population engaged in its numerous sawmills; *Papineauville*, chief town of the old domain of the "Little Nation," is one of Canada's historical sites; and *l'Orignal*, on the right bank, is the largest place in the lower Ottawa valley. The surrounding forests, however, despite its name, are no longer frequented by the original deer. In summer large numbers of strangers and invalids land at this station, attracted by the neighbouring *Caledonia Springs*, whose sulphurous, saline, and ioduretted waters are regarded as sovereign remedies against rheumatism and other maladies.

At *Grenville*, a large place on the left bank, a canal and lateral railway enable riverain craft and passengers to turn the famous *Carillon* rapids. Near the village of this name below the falls and factories is shown the spot where, in 1660, sixteen Frenchmen from Montreal, a Huron and four Algonquins, commanded by Daulac, threw themselves into a little log fort to delay the march of 700 or 800 Iroquois warriors who were invading the colony, thus saving their fellow-countrymen at the sacrifice of their own lives. All perished, the last survivor despatching his wounded comrades with a hatchet to save them from torture and the stake;

but the enclosure was encumbered by so many bodies of the enemy that they feared to advance farther and withdrew to the recesses of their forests.*

The watercourse which reaches the Ottawa below Carillon at the western extremity of the Lake of the Two Mountains has been named the North River. Compared with the great affluent it is a small stream, but at the town of *St. Jerome* its perfectly limpid current is utilised for one of the largest paper-mills in Canada. The river here falls a total height of 300 feet down a long series of rapids. Notwithstanding its distance from the St. Lawrence, the vital artery of the country, *St. Jerome* aspires to become one of the great cities of the Dominion. It is the terminus of the projected "Northern Railway," which will traverse the more productive regions situated near the Height of Land, and which will form a junction through Lake Temiscaming on the one hand with the Pacific trunk line, on the other with Hudson Bay.

A headland on the Lake of the Two Mountains is occupied by the pleasant little village of *Oka*, called also *Mission au Lac*, at a point where one branch of the Ottawa sweeps north-eastwards round the north side of the island of Montreal, and bifurcates round Jesus Island. Since the end of the seventeenth century *Oka* has been inhabited by some civilised Iroquois and Algonquin Indians, who live by fishing and agriculture; but they are confined to a very narrow domain of 700 acres, which is being continually encroached upon by the whites. Some Catholic missionaries are stationed at *Oka Point*, and the Trappists have founded a famous monastery on the neighbouring forest-clad mountain.

Nevertheless the Indians who settled in the district during the second decade of the present century are nearly all Protestants; the suit which they have brought against the Roman Catholic seminary of Montreal has become a sort of local *cause célèbre*. They claim to be reinstated in the contiguous lands, which formed part of the old seigniorship or lordship of the Two Mountains granted to the Sulpician fathers.† They have been offered in exchange 100 acres per family on a reserve near Muskoka in West Ontario, and most of the Indians of *Oka* have accepted this offer.

There are few more delightful positions than this peninsula of *Oka*; but the village of *St. Anne*, at the extremity of Montreal Island, would be a still more charming place had not two rival railway companies chosen the very mouth of the Ottawa for two parallel viaducts of unlike style but like ugliness.

Formerly travellers stopped at *St. Anne* to prepare themselves by prayer for the perilous ascent of the Ottawa, and the dangers to which they would be exposed from Indians and wild beasts in the region of the divide. It was here also that Moore composed his "Canadian Boat Song," the softest and most popular of all that are echoed in English speech on the Canadian waters. *St. Anne* stands at the very portal of the St. Lawrence. The Lake St. Louis, which is seen from this point stretching away to the east, unites in its basin the parallel currents of the

* *Relations des Jémites*; F. X. Garneau, *Histoire du Canada*.

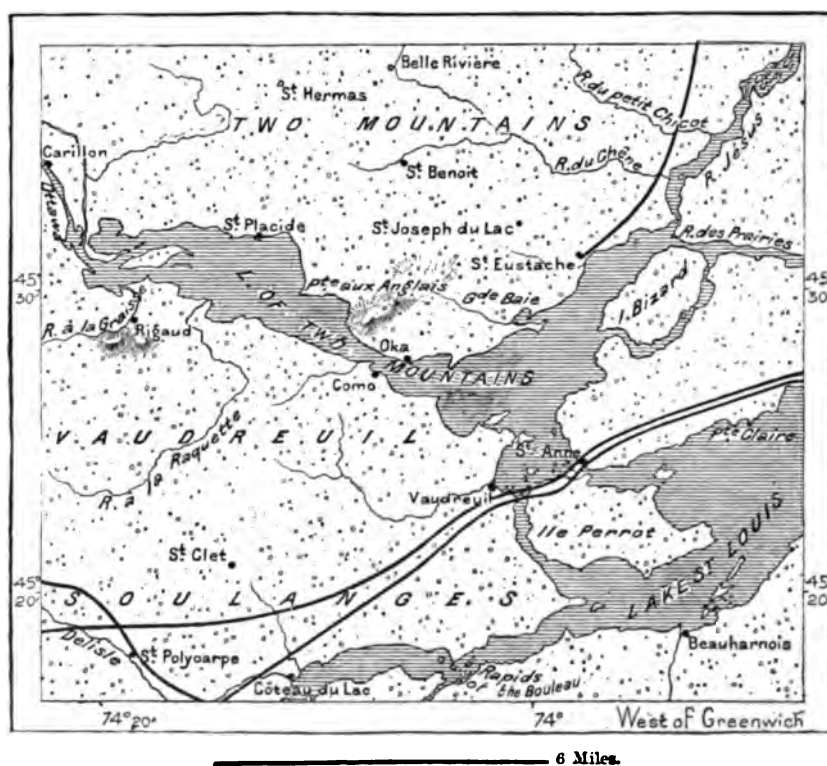
† The Sulpicians are a congregation of secular clergy, so called from their founder, Jean Jacques Olier de Verneuil, parish priest of St. Sulpice, Paris, in the middle of the seventeenth century. They have several seminaries in France and two in America, Baltimore and Montreal.

two streams, the yellowish Ottawa on the north, the green waters of the St. Lawrence on the south. On the southern bank stands the village of *Châteauguay*, where in 1813 the Canadian Basque, Salaberry, at the head of a small force, held out against a whole army of American irregulars.

Below the Ottawa confluence an inlet in Lake St. Louis is occupied by the town of *Lachine*, that is "China," apparently so named by Champlain in the hope of making it the starting-point of his contemplated expedition to the vast empire of East Asia. He supposed, like so many others, that the Laurentian basin

Fig. 136.—CONFLUENCE OF THE ST. LAWRENCE AND OTTAWA.

Scale 1 : 450.000.



would lead to the entrance of the North-West Passage which had so long been sought.

Lachine is one of the oldest places in Canada ; at the foot of the rapids on the route to Montreal is shown an old house, which is believed by the local archæologists to have belonged to the brother of Cavalier de la Salle. But, lying too far within Indian territory, this French station was taken by assault in the year 1689 by the Iroquois, hereditary enemies of the French, and all its inhabitants massacred. At present Lachine is a flourishing place, connected with some industrial villages, where various crafts are plied. Here begins the canal, 13 or 14 feet deep, giving access to vessels of a considerable size above Montreal. Here are also the headquarters of the numerous yachts and pleasure-boats which

enliven the waters of the lake; the river, obstructed lower down by tremendous rapids, here expands into a spacious basin, admirably suited for boating and regattas.

Eastwards Lake St. Louis is limited by the fine viaduct of Lachine, which connects the railway systems on both sides of the St. Lawrence. This bridge, 3,700 feet long, is of irregular form; towards Lachine it presents a series of piers placed close together; then it crosses the deep channel by two long spans, beyond which it is continued towards the right bank by a high embankment fringed with osiers. But despite this lack of symmetry the structure produces a very graceful effect, thanks to the extreme lightness of the sections suspended above the stream; it was completed in seven months.

Caughnawaga, which is connected by the viaduct with Lachine, is an old Iroquois settlement still inhabited by their descendants, who numbered nearly 1,600 in 1886. But they are crossed by French blood, live like the whites in houses built and furnished in the Canadian style, and are Iroquois Indians only in the eyes of those tourists to whom they sell fancy objects in birchwood, mocassins of deer skin, and the like; on grand feast-days, however, they still deck themselves with feathers. The steamers that shoot the rapids are generally in charge of one of their pilots, and some boatmen from the same village accompanied the British expedition to Khartoum to assist in ascending the Nile cataracts.

MONTREAL.

Below the rapids the village of *Laprairie*, so named from the grassy vegetation covering the alluvia formerly deposited by the St. Lawrence, stands on a deep inlet on the right side of the river. From the strong embankment here protecting the low-lying lands from inundations, a view may be obtained of *Montreal*, stretching along the opposite side of the river. This is the largest city in Canada and in the whole of North America above the latitude of Boston. It still bears, under a slightly modified form, the name of "Mont-Royal," given by Cartier in 1535 to the wooded hill which dominates the island at the confluence; it had thus already received its name over a century before the French had erected a single hut on the spot previously occupied by the triple palisades of the Iroquois village of *Hochelaga*. The exact site of this village has not been determined, but according to M. Benjamin Sulte, it stood at the very foot of the hill now occupied by Montreal; the modern suburb which has taken the name of the Indian stronghold lies at the northern extremity of the city, and skeletons, pottery and arms have been brought to light in many parts of the island.*

After the first French visit great changes had taken place, and when Champlain arrived in 1611, the Iroquois had already been driven out by the Algonquins. Their station of Hochelaga had been so completely destroyed that no vestige of it could be discovered. Recognising the admirable position of Mont-Royal as the converging point of all the routes from the regions of the Upper Laurentian basin, Champlain endeavoured to establish a factory on the spot; but the first

* J. W. Dawson, *Fossil Men and their Modern Representatives*.

permanent settlement was founded thirty-one years later, under the direction of Maisonneuve in 1642. Having been duly consecrated by the pious founder, the station took the name of *Ville Marie*, which still survives in the seminary that stands on the spot where the religious ceremony took place.

But this nucleus of the future city, situated on a steep cliff commanding the left bank of the St. Lawrence, occupies but a very small portion of the space now

Fig. 137.—GROWTH OF MONTREAL.

Scale 1 : 50,000.



covered with houses and streets. Both above and below, the urban quarters extend for some miles. Towards the west they have annexed a swampy depression formerly watered by a winding rivulet, but now traversed by one of the leading thoroughfares. The slopes of the Mont Royal escarpment have also been built over, and the city proper now covers an area of nearly ten square miles; but beyond the municipal limits it is continued in both directions by several suburban quarters.

Even had Champlain and Maisonneuve neglected the admirable position

offered by the terraces at the foot of Mont-Royal, an important town could not fail to have sooner or later sprung up on this spot. Standing at the head of the deep-sea navigation, it must necessarily have become a busy entrepôt for the goods transhipped from European vessels to the native canoes and riverain craft. The surrounding district is also extremely fertile, and its agricultural produce can here be conveniently exchanged for commodities imported from abroad.

To these local advantages are added others of a more general character derived from the relief and main physical features of this part of the continent. The city lies precisely at the point where the line of depression beginning at the port of New York follows the Hudson valley and Lake Champlain until it strikes the fault of the St. Lawrence. Here, therefore, begins the natural overland route between the Canadian river and the largest American seaport. On the other hand, Montreal occupies the point of the river which is least distant from the New England seaboard. Hence it naturally sought to develop its communications as rapidly as possible through the breaches in the Appalachian system with the numerous inlets indenting the north-east coast of the States, those especially of Portland and Boston, which offer an alternative outlet towards the Atlantic.

Montreal, moreover, commands the whole of the extensive Ottawa basin, which, though till recently scarcely inhabited, is destined to be covered with thriving settlements. Furthermore, it offers a natural outlet for the trade of Lake Ontario, while through the lacustrine isthmus stretching towards Georgian Bay it must become the dépôt for the produce forwarded by the great lakes, Huron, Michigan, and Superior. Lastly, thanks to the direct *Soo*, or Sault Sainte-Marie railway, it is already regarded as the most convenient Atlantic port for Minneapolis and the other cities of the Upper Mississippi basin. Thus Montreal is the converging-point of the chief trade routes of Canada and a large part of the United States.

Yet its progress at first was extremely slow. The lack of civilised populations in the Laurentian regions, the hostility of the formidable Iroquois Indians, who infested the surrounding forests, prowling about in quest of white scalps, the incessant warfare and rivalries between the early French and English settlers, the absence of all trade with the inland tribes except the peltry monopoly, for a long time prevented the city from deriving any benefit from its great natural advantages.

In 1689 Montreal was in imminent peril of being captured and sacked by the Iroquois, and thus suffering the fate of its outlying station of Lachine. Soon afterwards the English actually occupied the town, but failed to seize its citadel. It was again captured by the Americans in 1775, and all these troubles checked the growth of trade and population till the conclusion of the War of Independence. A great stimulus was given to its development by the construction of canals and railways, which began to radiate round the city about the middle of the present century. At present the total population of the city and its commercial dependencies exceeds 230,000 souls, or one-thirtieth of all the inhabitants of British North America.

Without offering the absolute geometrical regularity of most American towns, the plan of Montreal is symmetrical enough, despite the natural inequalities of the ground, and the absorption of several less uniformly constructed suburbs. The eminence occupied by the first French colonists still remains the central

Fig. 138.—APPROXIMATE DISTRIBUTION OF NATIONALITIES IN MONTREAL.

Scale 1 : 55,000.



quarter. Here stand the oldest buildings, piously preserved despite their lack of architectural beauty. Here also are grouped the more sumptuous modern monuments, such as the City Hall, the Palace of Justice, the Post Office, the chief banking establishments, and the two great churches, one the largest in the Dominion, the other the oldest and most venerated in Montreal.

The Champ de Mars, a historical site where the populace gathers at times of political excitement, also occupies a part of this central district, and the first thoroughfare opened on the crest of the rising ground was the Rue Notre-Dame, which now extends from one end of Montreal to the other for a distance of six miles nearly parallel with the river, and is continued at both ends by shady avenues. The other avenues also follow the course of the river, which here flows nearly south and north, while the transverse streets running east and west rise from terrace to terrace towards the foot of Mont-Royal. The wealthiest and healthiest quarters extend along this escarpment, the chief building materials being wood and brick as in all the large towns of Upper Canada. But most of the public monuments are constructed of a very hard limestone of a somewhat dull colour, which is extracted from the neighbouring quarries. The finest, however, are built of a red sandstone imported from the United States, and are often adorned with granite columns and copings brought all the way from Scotland.

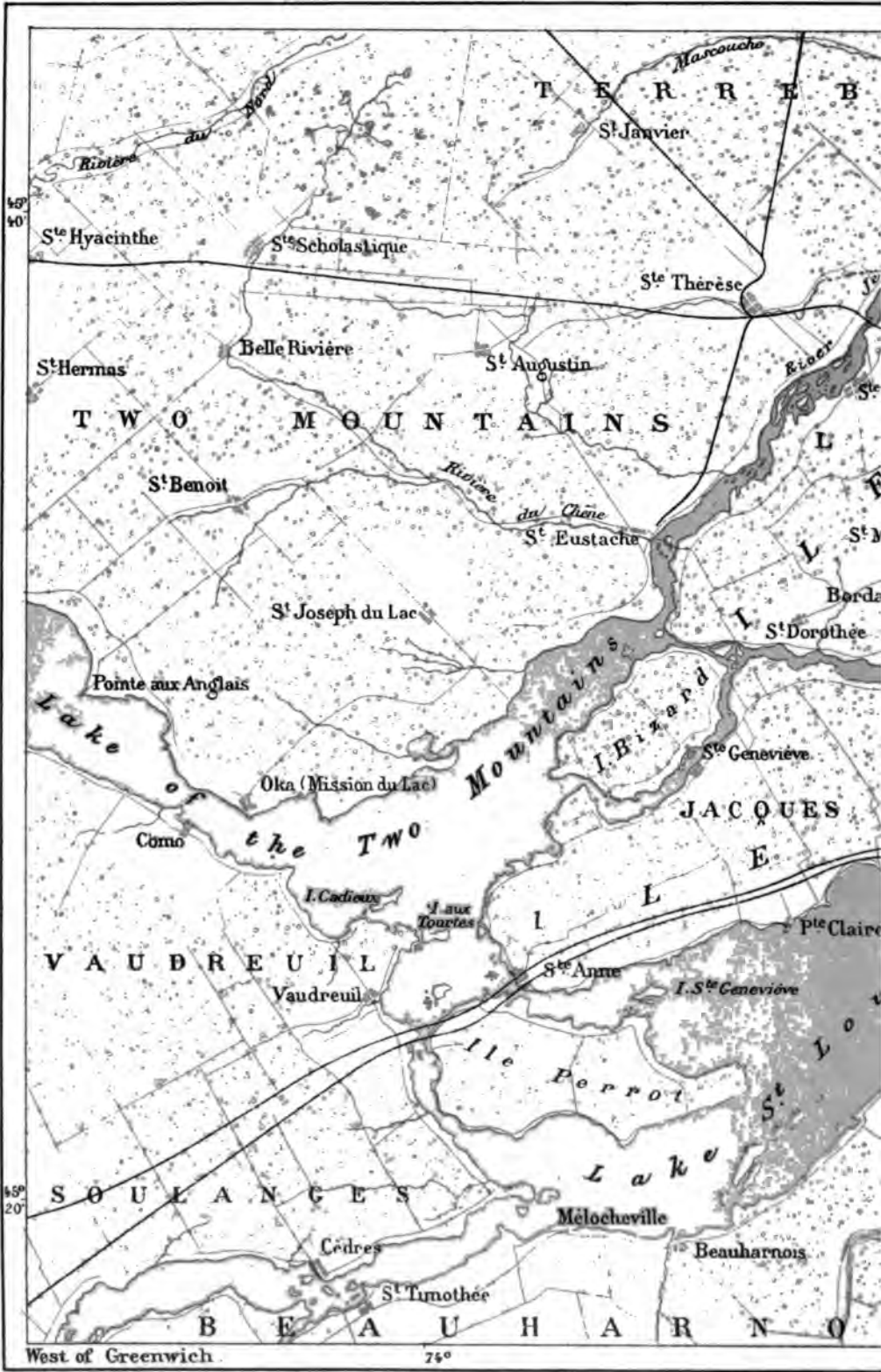
Montreal is a double city. The contrast presented everywhere in the Dominion between two rival races struggling for the ascendancy is reproduced in the great Laurentian emporium. Two nationalities and two languages here confront one another, as in Fribourg, Bienne, and some other Swiss towns and give rise to the same religious, political, and social wranglings; which, however, rarely lead to serious conflicts. They lose somewhat of their virulence by the very fact of their continuity, as well as through the safety-valve of the electoral contests, when more serious questions yield to the claims of ambitious candidates.

The Franco-Canadians are the more numerous, and their absolute preponderance is yearly increasing by the normal excess of births over the mortality. About the middle of the present century, the citizens of French race and speech were less than half, now they are in a considerable majority, although the death-rate is far higher amongst them than amongst their rivals. During the epidemic of small-pox, which prevailed in 1885, of 3,164 victims, as many as 2,887 were said to be Franco-Canadians, and the normal mortality amongst them is over 36 per 1,000, whereas it is under 27, 23, and 15 amongst the Irish, English, and Scotch respectively.

But all these losses are more than repaired by the continuous inflow of the Franco-Canadian rural populations, the same tendency prevailing here as in all industrial countries. Nevertheless, the French Canadians take the lead only in numbers, and are outstripped in commercial enterprise by the rival element. The large industries and undertakings involving possible risk of sudden failure are generally left to the Anglo-Canadians, the Scotch and American immigrants. Nor do the Franco-Canadian functionaries stand on the same level as their English competitors, who fill the highest and especially the most lucrative posts in the Civil Service. The most fashionable quarters, diversified with green swards and shady pleasure grounds, belong, for the most part, to the English; and the St. Antoine quarter, where scarcely any French is heard, alone contributes more than a third of the local rates.

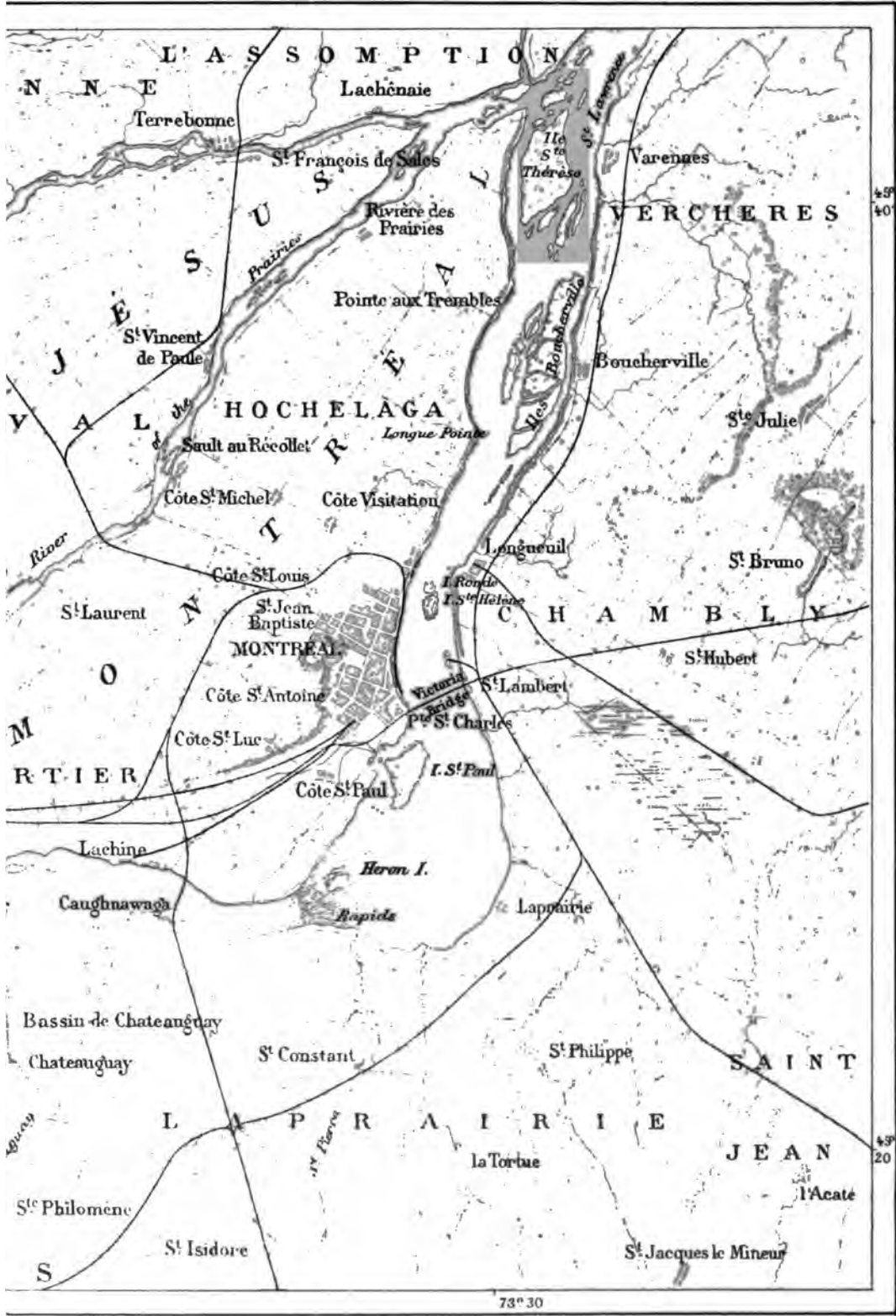
The Irish, mostly Roman Catholics like the French Canadians, but their

MONTREAL AND



NEW YORK

ITS ENVIRONS.



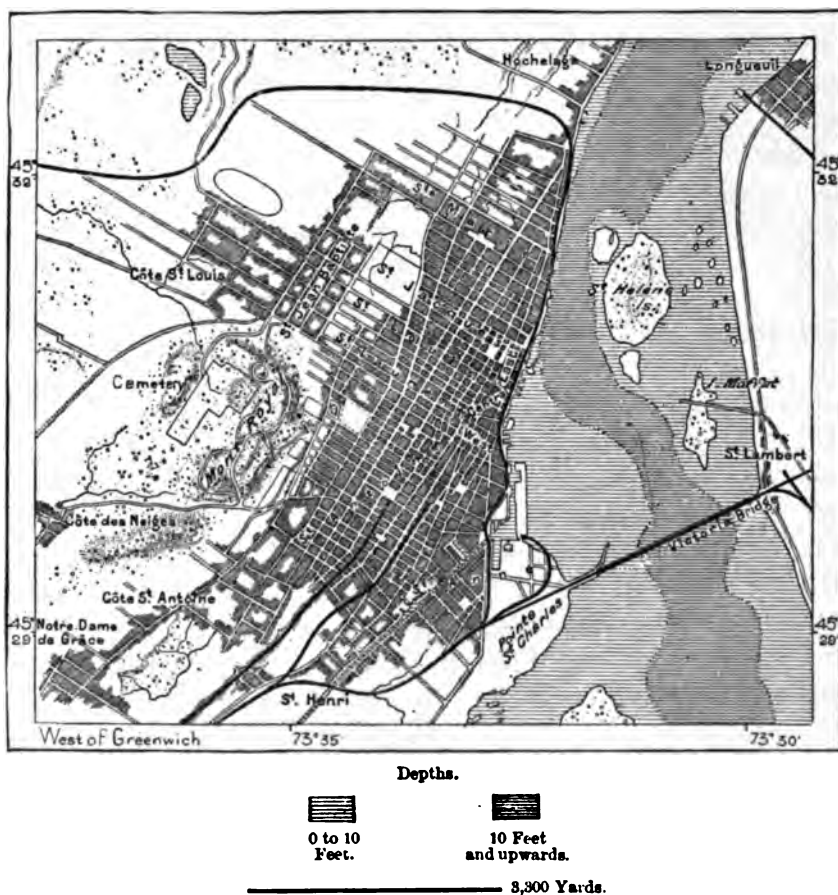
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rivals in the petty industries and workshops, and nearly always their political opponents and enemies, occupy the Griffin-Town quarter, which lies in the former marshy district higher up the river. Recently, the Italian colony, doubtless destined, sooner or later, to merge in the French-Canadian section, has increased rapidly ; but the Germans are scattered in small groups over the city. Those who pass under this name are, however, for the most part Jews from Silesia, Poland, Austria, and Russia, nearly all pawnbrokers and dealers in old clothes or

Fig. 139.—MONTREAL IN 1889.

Scale 1 : 90,000.



marine stores. They possess little national sentiment and no solidarity ; hence in the course of two or three generations they become completely absorbed in the surrounding English-speaking populations.

To obtain a general bird's-eye view of the city and its widespread suburbs of diverse nationalities, the visitor must ascend the slopes of Mont-Royal, which are now accessible both by carriage roads and a steeply-graded railway. The summit is largely occupied by the public park, which is all the more beautiful that the primeval forest has been left almost entirely in its natural state. Through

the clearings in the woods, vistas are here and there obtained of the city, laid out like a chessboard, with its pink houses and grey roofs, the several blocks enframed in a green setting of shady avenues. The various buildings may be distinguished by their domes, pinnacles, and clock-towers, while in the distance and along the harbour may be seen the tall chimneys of the factories, the pyramidal roofs of the grain-elevators, the long streaks of steam or smoke from passing trains and steamers.

But beyond all these works of man, when the smoky curtain lifts, the observer beholds the majestic river, here nearly two miles broad, and looking more like a tranquil lake separated into two basins by the hills of St. Helen's Island. Above stream is seen the long oblique line of the Victoria Bridge crossing the St. Lawrence, and in clear weather the view is said to stretch away beyond the broad plains of Richelieu as far as the waters of Lake Champlain and the Vermont Mountains. Westwards, the prospect is more open, extending beyond the Ottawa in the direction of the inland forests.

The western escarpment of Mont-Royal has been reserved for the cemeteries, and the reservoirs have been excavated on the heights, themselves immediately above the city. The chief basin contains about 160,000 tons of water, derived from the St. Lawrence at a point nearly two miles above the rapids. Altogether, the supply is sufficient for a daily allowance of as much as 110 cubic feet per head of the population.

Besides its wonderful "Mountain Park," Montreal possesses an equally wonderful "Island Park," covering nearly the whole of St. Helen's Island, which lies about 630 yards from the quays of the lower town. The little enclave, reserved by the Government, is set apart for military exercises. St. Helen's, so named in honour of Champlain's wife,* forms a little group of rocky hills disposed parallel with Mont-Royal; from its shady avenues of maple and elm trees, is unfolded an animated view of the shifting scenes up and down the river. Between the island and the right bank of the St. Lawrence follows a continuous line of rocks and reefs, some almost flush with the surface and covered with a few tufts of verdure, others barely indicated by a few flecks of foam or short yeasty wavelets.

At St. Helen's took place the capitulation of Montreal in 1760, when the last square foot of land held by the French on the Northern Continent passed into the hands of their British conquerors. Nevertheless, the Canadian inhabitants of the Sault Sainte-Marie still flew the French flag, until they were overtaken in their remote western solitudes. Lemoigne d'Iberville, who marched from victory to victory, northwards to the Hudson Bay, southwards to the Gulf of Mexico, was a native of Montreal.

* "Associated with Champlain was a young wife, whose name has been handed down as one of the heroines of Canada. It was a happy augury that the first white lady who set foot in Canada should be one of such winsome manners and pure character, and those who read her story will learn with pleasure that her name is still commemorated in St. Helen's Island opposite Montreal. She visited the wigwams of the Indians, and attended to their spiritual as well as temporal wants, until the simple savages came to regard her as a superior being descended upon them from another world. Years after the death of her brave husband she, having returned to France, founded a convent of Ursuline nuns at Meaux, and there died."—(E. B. Biggar, *Canada, a Memorial Volume*.)



MONTREAL--ICE BLOCK ON THE ST. LAWRENCE.



Although situated 1,150 miles from Belle-Isle Strait leading to the Atlantic Ocean, and 100 miles above the tidal wave, Montreal is none the less a seaport in the strict sense of the word. Formerly it was accessible only for vessels of 300 tons burden, but since the dredging of St. Peter's Lake the largest transatlantic steamers are able to ascend the river up to its very quays. Nowhere else in the whole world can ocean vessels of 5,000 or 6,000 tons, drawing 30 feet of water, penetrate so far inland from the sea-coast. Even large sailing vessels might stem the current but for the expensive pilotage at several of the narrows, and the unavoidable loss of time. Hence the curious spectacle presented by the harbour, where scarcely anything is to be seen except steamers of all sizes, ocean liners, tugs, pleasure-boats, launches, ferry-boats, and barges. At Montreal some of the first essays were made at steam navigation. In 1809 a steamboat made a successful trip from this place to Quebec. The river craft, freighted with the produce of the upper regions, pass through the Lachine Canal to the extensive basins constructed near St. Charles Point in the southern part of the city. Here, the different commodities have all their separate storage room, in one place coal and ores, in another European wares, farther on cereals, and lower down, lumber of all kinds.

Owing to the relatively cheap water carriage down stream, the St. Lawrence attracts nearly all the produce intended for the east, whereas goods are forwarded westwards chiefly by the railways. Montreal is also by far the busiest industrial centre in the Dominion; most of its mills and workshops are situated in close proximity to the river.

In contrast with other American cities which generally present a labyrinth of dockyards and basins fronting the sea or river, Montreal shows nothing but a vertical quay skirting the river and flanked at some distance by a high embankment which runs along the front of the river and houses. All these structures are built with great solidity in order to resist the force of the current, which in spring, after the thaw sets in, accumulates enormous masses of ice along the banks. The frozen masses of Lake St. Louis, after breaking up, are carried down the Lachine rapids and heaped up at Montreal, where they form a barrage across the stream. Arrested farther down by the still unbroken ice-cap, they get piled confusedly together, and are at times raised by the swollen current 28 or 30 feet above the normal level, overhanging the quays to half the height of the houses.

In anticipation of the enormous pressure the landing-stages are detached from the shore before winter sets in, and towed away to some sheltered place. Then the waters flow back, rise above the embankments, and flood all the lower parts of the town. The streets of Griffin-Town and of the other southern quarters have occasionally been laid under water to a depth of 8 or 10 feet. After the inundations, the saturated soil long retains its moisture, and thus contributes to make Montreal one of the least salubrious places in Canada. Extensive works now in progress may perhaps secure the city from any overwhelming disaster, and it is hoped that a so-called "bôme," or solid rampart of beams, may prove strong

enough to arrest the ice of Lake St. Louis and regulate the discharge of the fragments sufficiently to avoid a jam lower down.

In average years the ordinary precautions suffice to prevent a disaster, and on the whole Montreal suffers less from floods than from fires. As elsewhere in Canada, winter is the festive season, given up to sledging, skating, "tobogganing," and other outdoor exhilarating amusements. The children are everywhere busy making their snow-men, and, as at St. Petersburg on the Neva, an ice castle is built with galleries, towers, donjons, the whole lit up with electricity.

Montreal is one of the American cities where the people enjoy themselves in the simplest way regardless of absurd social formalities and conventional laws of dress. Deprived of the title of capital in 1849, and evacuated by its British garrison in 1872, it has adopted relatively simple habits, replacing rigid etiquette by genial sociable ways. But, despite its hundreds of lawyers, it is probably inferior to Toronto in general instruction. Besides the English McGill University, frequented by five hundred students, it possesses another high school attached to the Laval University of Quebec, a large seminary, a normal school, and several other educational establishments.

Montreal communicates with some difficulty with its suburbs on the right side from which it is separated by the great river. The stupendous Victoria Bridge, which crosses the St. Lawrence higher up, can scarcely be considered as belonging to Montreal; it has no roadway for wheeled traffic, nor even a side-path for pedestrians, being exclusively a railway bridge on the tubular principle. Although possessing no claims to architectural beauty, the huge structure is none the less imposing from its very magnitude. Including the approaches it has a total length of 2,900 yards, and requires to be viewed from a considerable distance to realise its full proportions. On the upper side the piers, resting on foundations 160 feet deep, project with sharp buttresses to break the ice and throw it to the right and left. Nevertheless, these buttresses are often injured, and require to be constantly repaired. Of all structures of this type the Montreal tubular bridge is the largest and boldest; it was designed by Ross and Stephenson, and opened in 1859, having cost £1,500,000, and taken six years to build. Near the Montreal approach a block marks the spot where were buried 6,500 Irish emigrants during the summer of 1847, victims of ship fever, after escaping the horrors of the "potato famine."

Montreal will probably soon be connected by another bridge with its suburbs on the right bank of the river. This viaduct, starting from St. Charles Point above the harbour, will run obliquely towards St. Helen's Island, so as to avoid the formidable current of Sainte-Marie which sweeps by the lower part of the town. The section of the bridge between the island and the right side of the river will present no difficulty, the rocky bed of the stream being here very shallow. Owing to this circumstance the steam-ferry boats have always had some difficulty in approaching the village of *St. Lambert*, where the long piers running out to deep water get destroyed by the periodical jams.

The populous suburb of *Longueuil*, indicated miles away by its sumptuous church,

is more easily accessible by the steam-ferry rounding St. Helen's Island. During a recent severe winter a railway was extemporised on the frozen surface, and the trains ran regularly for several months, until the locomotive at last crushed through the ice-cap.

From Montreal to Quebec and St. Anne on the left, and to Rivière-du-Loup on the right side, villages and hamlets follow almost continuously. Here the concessions extend on an average about 2,200 yards inland, but the river frontage is very narrow, ranging from 190 to 380 feet so as to give as many as possible the advantage of access to the great artery. *Boucherville*, below Longueuil, is almost masked

Fig. 140.—ICICLES ON THE FRONT OF A HOUSE AFTER A FIRE.



by a chain of wooded islands, noted amongst sportsmen as excellent duck-shooting grounds. In spring the ice floating down from above is intercepted by these islands, and here a fresh jam is often formed, greatly retarding the navigation season. The channels between these islands are gradually silting up from the alluvial matter here deposited by the harbour drainage works, and if the process is continued much longer, the archipelago will form part of the mainland.

Lower down on the same side *Varennes*, opposite St. Theresa Island, is much frequented for its saline springs. On the opposite side the St. Lawrence is joined by the northern branch of the Ottawa, which is itself divided into two channels by the large island of Jesus. Both branches are studded with villages, none of which

has acquired any commercial or industrial importance. The most frequented is *Saut aux Récollets*, which is separated from Montreal by the hills of the public park. *St. Theresa*, some distance inland, is the converging-point of several railways.

Between the Montreal archipelago and the mouth of the Richelieu the banks of the St. Lawrence are occupied only by some straggling villages; here the largest place is *Assumption*, which, however, lies a few miles from the main stream in a fertile district encircled by a river accessible to steamers. At the Richelieu confluence stands the busy town of *Sorel*, commanding from its high cliffs the

Fig. 141.—RAILWAY ON THE FROZEN ST. LAWRENCE.



cluster of islands which fill the western extremity of St. Peter's Lake. Sorel is much frequented by steamers plying on the St. Lawrence and on the Richelieu as far as the head of the navigation at the Chambly basin, which expands into a broad sheet of water dominated by the ruins of an old French fortress. Beyond this point the Richelieu is blocked by rapids, which, however, are turned by a navigable canal giving access to *St. John's*, close to the United States frontier.

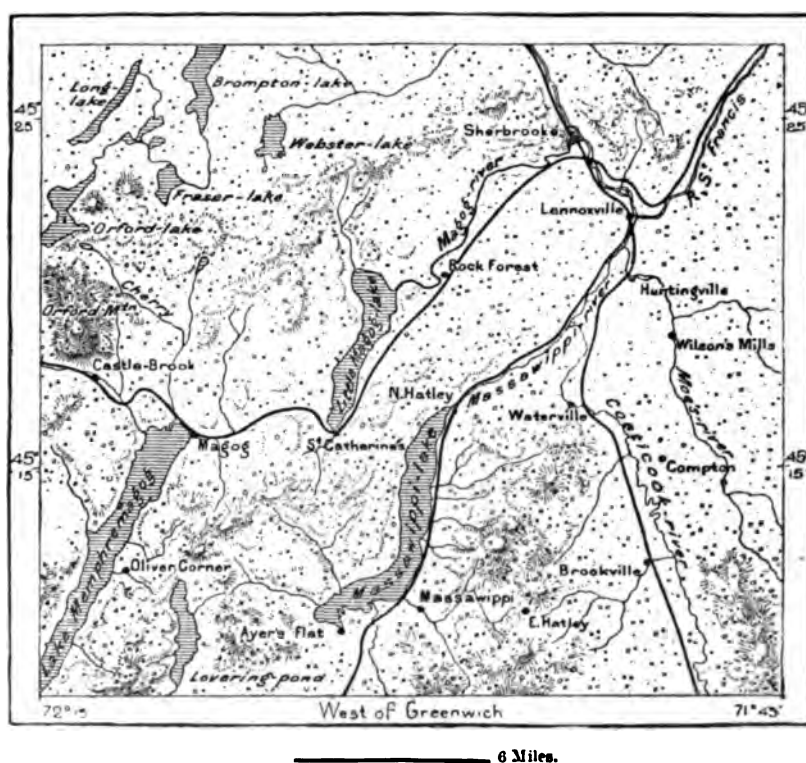
North of *Farnham*, an important railway centre on the Yamaska, lies the industrial town of *St. Hyacinth*, noted for its numerous factories. Another river reaching St. Peter's Lake almost immediately to the east of the Yamaska delta, comprises within its basin the most thickly-peopled districts of the region known by

the name of "Cantons de l'est." *Sherbrooke*, capital of this region, stands at the confluence of the *Magog* and *St. Francis* rivers, and is also a busy industrial centre, with numerous cloth, paper and other mills. *Magog*, at the northern extremity of *Lake Memphremagog*, has a large cotton-spinning factory, and *Lemonville*, at the bend of the *St. Francis* below the confluence, is one of the Canadian University towns.

The muddy banks of *St. Peter's Lake* present scarcely any suitable sites for villages; nearly all the little groups of habitations, such as *Berthier* and *Rivière-du-Loup* (*Louiseville*) on the north, *Yamaska*, *St. Francis*, *la Baie-du-Febvre* (*St. An-*

Fig. 142.—SHERBROOKE AND THE UPPER BASIN OF THE ST. FRANCIS.

Scale 1 : 400,000.



toine) and *Nicolet* on the south side, stand at some distance from the beach. *Louiseville* is visited chiefly for the sake of the neighbouring *St. Leon* saline springs. *Nicolet* possesses one of the largest establishments for public instruction in Canada; colonies of civilised Abenaki Indians, numbering altogether 560 souls, are settled at *St. Francis* and at *Bécancourt*.

Between *Montreal* and *Quebec* the chief trading centre is *Three Rivers*, which lies, not on *Lake St. Peter* but seven or eight miles lower down, at the confluence of the *St. Maurice* with the *St. Lawrence*; it takes its name from the ramifying branches of the lower *St. Maurice*, which joins the main stream nearly opposite the mouth of the *Bécancourt*. *Three Rivers*, which was founded in 1618, that is,

twenty-four years before Montreal, certainly owes its importance mainly to its position just below the farthest point reached by the tidal current. Here the Algonquins had built a sort of stronghold, and during the early period of the colonisation it became the bulwark of the French against the Iroquois, and the chief market for the Canadian peltry trade. It still does a considerable traffic in the lumber floated down by the woodmen of *St. Thècle, la Tuque* and *des Piles* on the upper course of the St. Maurice; but the blast furnaces which smelted the excellent ores of the neighbourhood now lie idle; they were erected in 1737, before any others in Canada, possibly in the New World.* At the time of the revival of Canadian literature the inhabitants of the Three Rivers district claimed to speak the purest French in the country; here was born the famous explorer, Varennes de la Vérendrye.

Below Three Rivers several pleasant villages follow along the left bank of the St. Lawrence as far as Quebec; but none of them rank as towns, and the copious affluents of the main stream, the Batiscan and the Jacques Cartier, flow through almost uninhabited regions. On the right bank the largest place is the industrial town of *Lotbinière*, which supports a few manufactures. But as the St. Lawrence approaches *Quebec* it becomes more thickly settled; below *Chaudière* on the river of like name and *Cape Rouge* on the opposite side, both banks are lined by an almost continuous chain of villages and hamlets.

QUEBEC AND ENVIRONS.

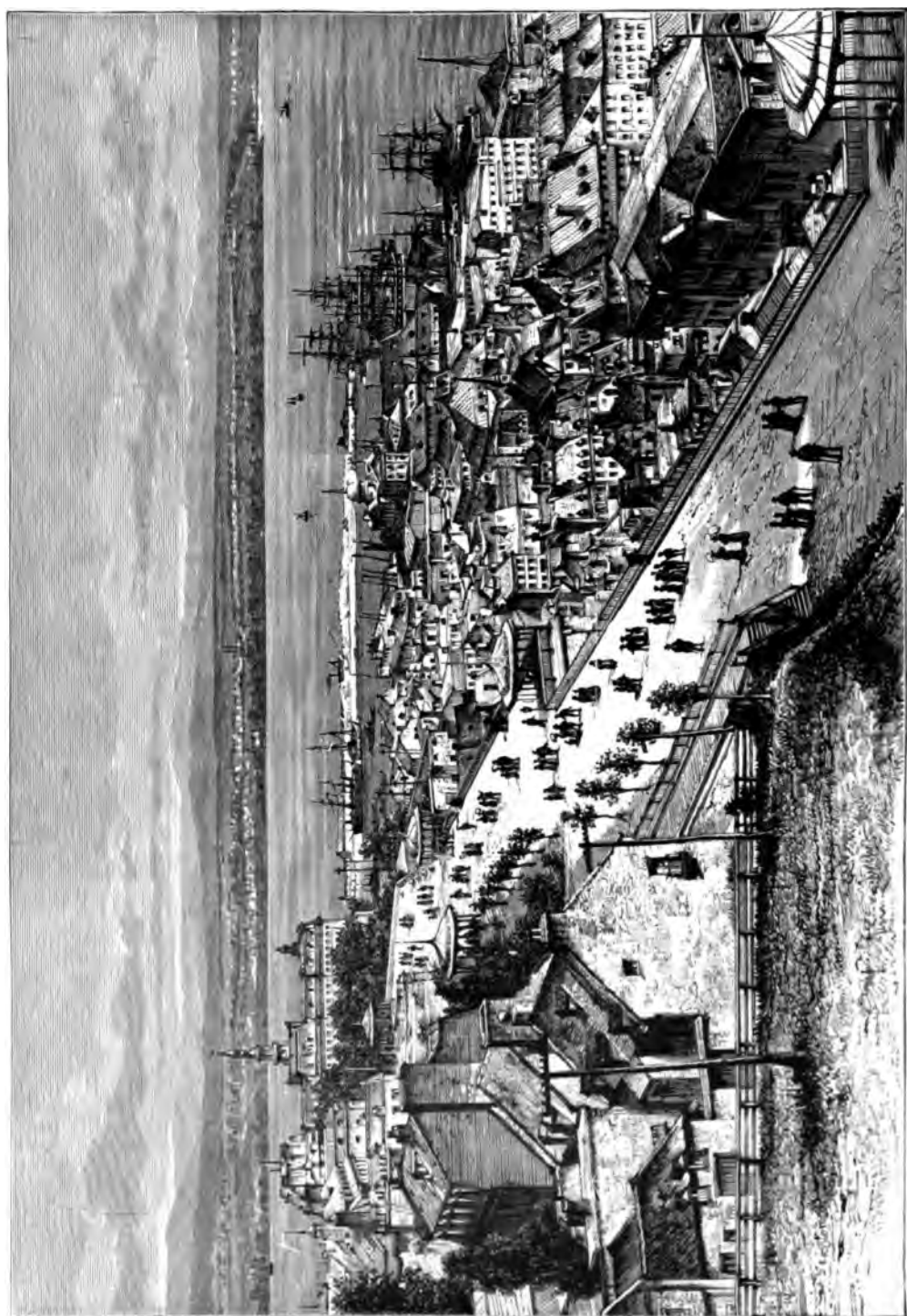
Quebec, formerly capital of Canada and still the chief town of one of the Confederate states of the Dominion, ranks amongst the oldest settlements in the New World, and is in a pre-eminent sense the historical city of the Laurentian region. It attracts American visitors by a sentiment akin to that which draws Europeans towards Athens and Memphis.† The political destinies of half a continent were decided in favour of the Anglo-Saxon race on the headland which here dominates the main stream at its confluence with the St. Charles.

From the native *canada* ‡ or "village" which was replaced by the French settlement, the whole country probably derived its name, the derivation of which has given rise to so much curious speculation. Jacques Cartier passed his first winter (1535) at *Stadaconé*, a riverain clearing on the St. Charles over against the heights now crowned by the towers of Quebec. He returned fifteen years later and constructed a redoubt at Cape Rouge above the present city; but the camp being threatened by the neighbouring Indians was soon abandoned. The origin of Quebec and of the whole of Canada dates really from the year 1608, when Champlain built the first cabins of the future city whose Indian name is explained by most etymologists to mean "strait or narrows," in reference to the river which here begins to contract above its estuary. At this point in fact it measures only 1,300 yards from bank to bank between Quebec and the village of Lévis. This channel, which

* Wurtele, *Transactions of the Royal Society of Canada*, 1886.

† G. Köhler, *Travels in Canada*.

‡ Jacques Cartier, *Bref récit de la Navigation aux îles de Canada*.



QUEBEC—VIEW TAKEN FROM THE TERRACE IN 1888.



might seem spacious enough for a river in west Europe, here looks relatively so narrow that we involuntarily regard it merely as a branch of the mighty St. Lawrence. The basin of the St. Charles, which, immediately below the headland, expands to a far greater width, might at first be taken for the true mainstream. In any case it forms the beginning of the vast estuary developed throughout its lower course by the St. Lawrence as it mingles with the marine waters, at last expanding to a veritable inland sea between the Gaspé peninsula, Labrador and Newfoundland.

No sooner was it founded than Quebec had to sustain the assaults of the enemy. It was attacked in 1628 by Kerth (Sir David Kirke), a native of Dieppe, but in the service of England, and though he was repulsed he returned next year and after a long blockade captured the young settlement, which at that time had

Fig. 143.—"CANADA" OF QUEBEC, AFTER A SPANISH MAP OF THE 15TH CENTURY, REPRODUCED BY DUBO.



a population of only 107 souls. One or two families alone cultivated the soil; all the rest depended on the mother-country for their supplies, so that the least delay in the arrival of the re-victualling vessels was followed by famine and sickness.

Three years later Quebec was restored to France, but its progress continued to be very slow. The few colonists, mostly soldiers who remained in the country after retiring from the service, married native women, and their offspring to a large extent relapsed into the savage state. Canadian society was not properly constituted until marriageable young women were introduced direct from France. The new families were grouped almost exclusively round Quebec, whence in due course they sent off fresh swarms up and down the river.

The British settlers at Boston could not allow the French colony to develop itself peaceably in the threatening position which it occupied at the back of the English possessions. In 1690 a Bostonian flotilla was repulsed by Frontenac; some years later another fleet, which had also sailed from Boston to reduce the

French citadel, was almost completely wrecked on the reefs before reaching the fortress. But in 1759 the decisive campaign was opened and closed by Wolfe, who presented himself before Quebec with 8,000 British troops, and was at first defeated in an engagement fought with the French commander, Montcalm, on the plains of *Beauport*, which are separated from the town by the St. Charles estuary. But, snatching victory from his very discomfiture, he took advantage of a dark night to ascend the river under the very walls of the citadel and scale the heights from the west. The fortifications were thus taken in the rear before Montcalm had time to re-form his forces. A second battle was fought on the Plains of Abraham, when the French were completely routed and compelled to retreat across the St. Charles. Both generals fell, one shrouded in victory, the other in a scarcely less glorious defeat.*

Next year the struggle was renewed, the French in their turn besieging the place. A sanguinary engagement had obliged the British garrison to withdraw within the walls of the citadel, and Canada might possibly have been recovered by France, but for the opportune appearance of a British fleet in the harbour. Three years later the ascendancy of England in the St. Lawrence basin was definitely secured by the Treaty of Paris.

Nevertheless Quebec had to undergo yet another siege. In 1775, during the War of Independence, the Americans essayed to wrest it from England, but the attempt failed, and since then Quebec has become the "Gibraltar of America." The citadel, which crowns the summit of Diamond Cape, above the almost inaccessible fluvial escarpments, is carefully maintained in a state of efficient defence, although its British garrison has been withdrawn. The old ramparts, which have long been outgrown by the new quarters, are also preserved on the upper slopes; but the gates have been rebuilt to leave more easy access to wheeled traffic, while the outer lines and moats have been transformed to public promenades and playgrounds for children. The walls of the citadel and the surrounding heights are defended by batteries, and the works guarding the approaches to the St. Lawrence have been completed by the fortifications recently constructed on the headland at Lévis over against Quebec.

Seen from the river, or from the heights of Lévis, Quebec seems a small place. A great portion of the hill is occupied by the ramparts and scarp of the citadel, and a few buildings are seen rising above the slopes, while the shore-line is fringed by the narrow zone of the lower town, which is continually threatened by the ravined cliffs of the fortress. Houses and their inmates have already been several times overwhelmed by avalanches from the overhanging precipices, and many lives were lost and much property destroyed by a tremendous landslip,

* "It was an admirable feeling in the descendants of both parties to this conflict that led them to erect a single monument to both generals. This monument stands in the Governor's garden, and bears on one side the name of 'Wolfe,' on the other 'Montcalm,' with a Latin inscription, of which this is a translation:—

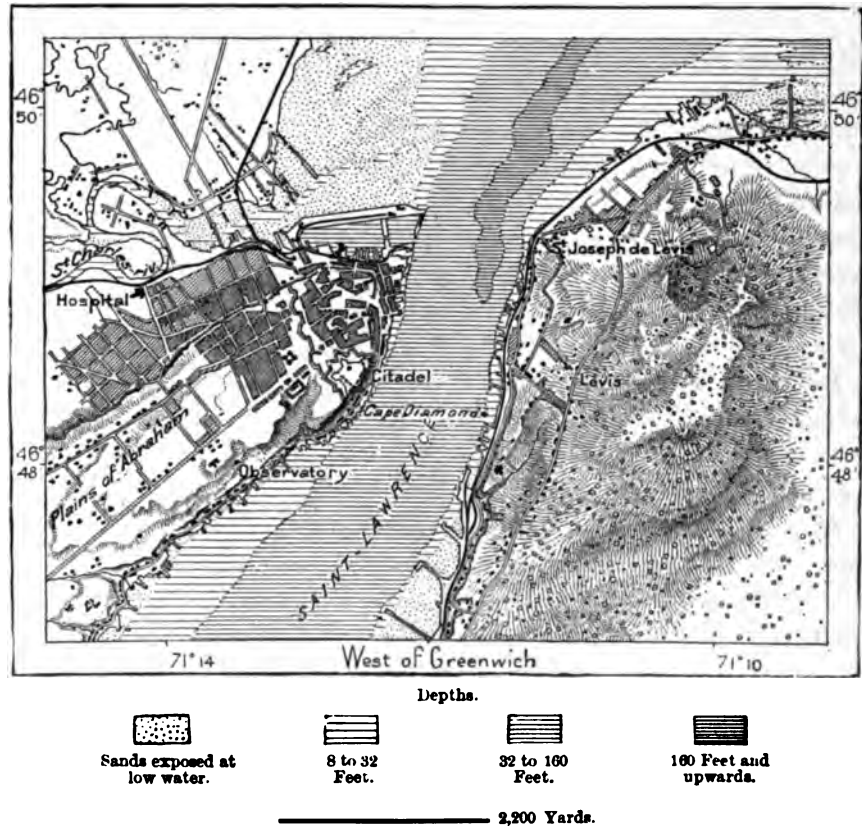
" 'Valour gave a united death,
History a united fame,
Posterity a united monument.' "

(E. B. Biggar, *op. cit.*)

which occurred in the month of October, 1889. The whole of this poor quarter should, in fact, be removed to a better position, and the tumbledown structures replaced by grassy swards. Meantime the new quarters are being developed back of Diamond Cape on the Plains of Abraham and in the direction of the St. Charles river.

Quebec owes its beauty especially to the marvellous panorama which is unfolded from the citadel, the Laval University, and Dufferin Terrace, a broad plat-

Fig. 144.—QUEBEC.
Scale 1 : 70,000.



form standing on the promontory midway between the St. Lawrence and the St. Charles estuary. Lower down, the hill is skirted by a semicircle of buildings, and quite a new quarter, occupied by docks and warehouses, has been developed at the point between the two sheets of water. Steam-ferries ply between both banks and the high cliffs of Lévis are crowned by a long line of villages, interrupted here and there by patches of verdure. North-eastwards, between the widening branches of the St. Lawrence, are seen the gently undulating green plains of Orleans Island; still more picturesque are the slopes on the left side merging northwards in the hazy atmosphere which half veils the distant headlands and the superb crest of Tourmente Cape.

Besides the citadel and the Dufferin esplanade Quebec has its historical monuments; in this respect it has, in fact, few rivals in the New World. On a square near the cathedral stands the obelisk raised to the memory of the two captains, Wolfe and Montcalm, united in death, in glory, and in the common tomb raised to them by posterity. Other columns, beyond the urban precincts, commemorate the last battles of *Abraham* and *Sainte-Foye*; a cippus has also recently been placed on the banks of the St. Charles to mark the site of the spot chosen by Cartier for his winter quarters during his famous voyage of discovery. Champlain's tomb is supposed to have been discovered in a house in Quebec, and the building is shown where Montcalm breathed his last.

Some religious edifices, the basilica, other churches, seminaries, and convents, possess precious tablets, dating for the most part from the period anterior to the French Revolution. Unfortunately such old records, books, and other collections still remain unprotected by a fire-proof building, although the Canadian libraries are constantly suffering from conflagrations: "they are only good for bonfires," has become a popular saying.

The Laval University, so named from the prelate* who in 1663 founded the seminary transformed in the middle of the present century to a school of science, includes the most important collection of paintings in America north of Boston, containing originals by Tintoretto, Puget, and Rubens. The library, comprising about 100,000 volumes, is admirably classified, and ranks in importance next to that of the present Canadian capital; its mineralogical collection has been specially arranged by Haüy.

Quebec has long ceased to be the largest city in the Dominion; at present it yields in population both to Montreal and Toronto, and judging from its slow progress it will soon be outstripped by other more modern and more industrious places. It numbers about 90,000 inhabitants, including the suburbs on the left and the villages on the right bank, which ought to be regarded as forming part of Quebec, as they share in its trade and are the termini of the railway systems connecting it with New Brunswick and the United States.

Doubtless Quebec has the advantage of an excellent harbour, now completed by slips and docks; it may also be regarded as the head of the navigation for sailing vessels. But since the deepening of Lake St. Peter, the largest steamers are able to ascend the river right up to Montreal; hence the aggregate of the Quebec

* Monseigneur de Laval, a noted personage in Canadian ecclesiastical history, was the first bishop of "New France." A scion of the noble family of Montmorency, "he had all the vigour, all the courage, and a full proportion of the pride which belonged to his lineage. He arrived in Quebec in 1658, and assumed, with no faltering grasp, the reins of ecclesiastical power. He divided the country into regular parishes; he founded in 1663 the Seminary of Quebec, the Grand Seminary for the training of the clergy of his diocese, and the Little Seminary for general education. To this institution he devoted all his own wealth, and, after thirty years' labour, retired to spend within its walls the remainder of his life. It was not till 1852 that the ultimate design of its founder was realised and the Seminary was erected into the Laval University. The building, which is 297 feet long, and five storeys high, with a wing 265 feet long, stands out boldly in the forefront of the upper town, presenting an imposing appearance as viewed from the water below. There are four faculties in this university—theology, law, medicine, and art. It has thirty-four professors and three hundred students, and fourteen colleges and four grand seminaries are affiliated to it.—(E. B. Biggar, *op. cit.*)



ICE BRIDGE ON THE ST. LAWRENCE—VIEW TAKEN FROM QUEBEC.

shipping decreased as much as 150,000 tons during the ten years from 1876 to 1885. Moreover, it has the inconvenience of lying in too cold a climate on a river completely blocked by ice throughout the winter months; nor is it surrounded like Montreal and especially like Toronto by broad arable lands whence to draw its supplies. Towards the north it verges almost on the solitudes which stretch away to Hudson Bay, and the two first railways running northwards have only recently been connected with its system; one of these lines runs straight to St. John's Lake, the other skirts the left bank of the river in the direction of Montmorency and St. Anne.

The chief trade of Quebec is in Canadian and American timber floated down by the Ottawa, the St. Maurice, Michigan, and Maumee. The building of wooden vessels, formerly the most important industry both of Quebec and Lévis, has been almost entirely lost. Here were formerly built vessels of over 3,000 tons, but they were merely compact masses of timber, which was in this way exported to England and then taken to pieces. By these sham vessels exporters were able to avoid the absurd custom-house regulation which declared the importation of vessels free, but imposed a heavy tax on imported timber. At present the most active local industry is the boot and shoe manufacturing business, for which leather is imported chiefly from Buenos Ayres.

Communication with the suburbs and railways on the right side of the St. Lawrence is kept up by the steam ferries, which enjoy a monopoly of the transport business. These boats, armed with spurs at the prow, are so constructed as to break up the ice which forms and re-forms incessantly throughout the winter. But it sometimes happens in exceptionally severe seasons that the "ice bridge" gets too thick and too hard to be thus cleared away. About the middle of the present century the whole river was frozen over in a single night from the Lachine rapids all the way to Crane Island below Quebec, a total distance of 220 miles. At such times the St. Lawrence presents the aspect of an interminable white or greyish plain, often masked by whirlwinds of powdery snow, and streaked by the long tracks of sledges and pedestrians travelling from town to town. The crystal surface is also "navigated" by sailing boats mounted on skates or rollers.

The two banks will probably ere long be connected by a bridge; but this structure, projected in the interests of the railway companies, will scarcely tend to promote intercommunication between the populations on the opposite sides of the river. It is proposed to construct the viaduct at Cape Rouge, 7 or 8 miles south of Quebec, almost opposite the point where the St. Lawrence is joined by the Chaudière. Here the river contracts to a width of not more than 880 yards, by far the narrowest part of the channel below the Lachine rapids; but the bed of the stream is some 300 feet lower than the banks in the central parts. From two granite piers, built in 44 feet of water near the shores, will spring a central arch 1,450 feet long and 460 feet above the surface. No doubt this stupendous work, almost comparable to the Forth Bridge at Edinburgh, will tend somewhat to displace the local trade and draw it farther up stream. The village of *Sillery*,

at present noted for its green swards and shady walks, will assume a very different aspect when surrounded by dockyards, depôts, and warehouses.

In connection with this subject it may be mentioned that another bold project for bridging the St. Lawrence at Brockville, much higher up, was announced in April, 1890. At this point the river contracts to less than a mile in width, and it is proposed to connect Brockville on the Canadian side with Morristown on the American side in the state of New York, by a railway viaduct of colossal proportions. This structure, which will probably be taken in hand at an early date, will comprise no less than nineteen spans, laid on piers of tremendous strength to resist the force both of the current, here very deep and rapid, and of the ice at the periodical break-up in spring. According to the published plans the chief span will be 525 feet long, and will be constructed on the cantilever principle, which has been so successfully carried out on a far larger scale at the Forth Bridge.

SETTLEMENTS ON THE LOWER ST. LAWRENCE.

Other picturesque places are dotted over the neighbouring district. Such are the cascades of *Nouvelle-Lorette* and of the *Chaudière*, the latter flowing from the lovely Lake Megantic, and the still more celebrated *Montmorency Falls*, tumbling from a height of 250 feet into a regular basin of uniform width, its graceful parabolic curve unbroken by any projecting rocks or ledges. The Canadians call it the "Vache," comparing it to that of the Valais, to which it bears some resemblance, only the Montmorency sends down a larger volume of water than the Sallanche.

Below Quebec the villages fringing both banks may be regarded as maritime stations, in respect of the salinity of their tidal waters, their marine beaches, banks of seaweed, fishes, cetaceans, and sandy dunes. *Montmagny*, on the right bank, recalls the name of a governor, the Latin form of which (*Mons Magnus*) secured for all his successors the Algonquin title of Ononthio, "Big-Hill."

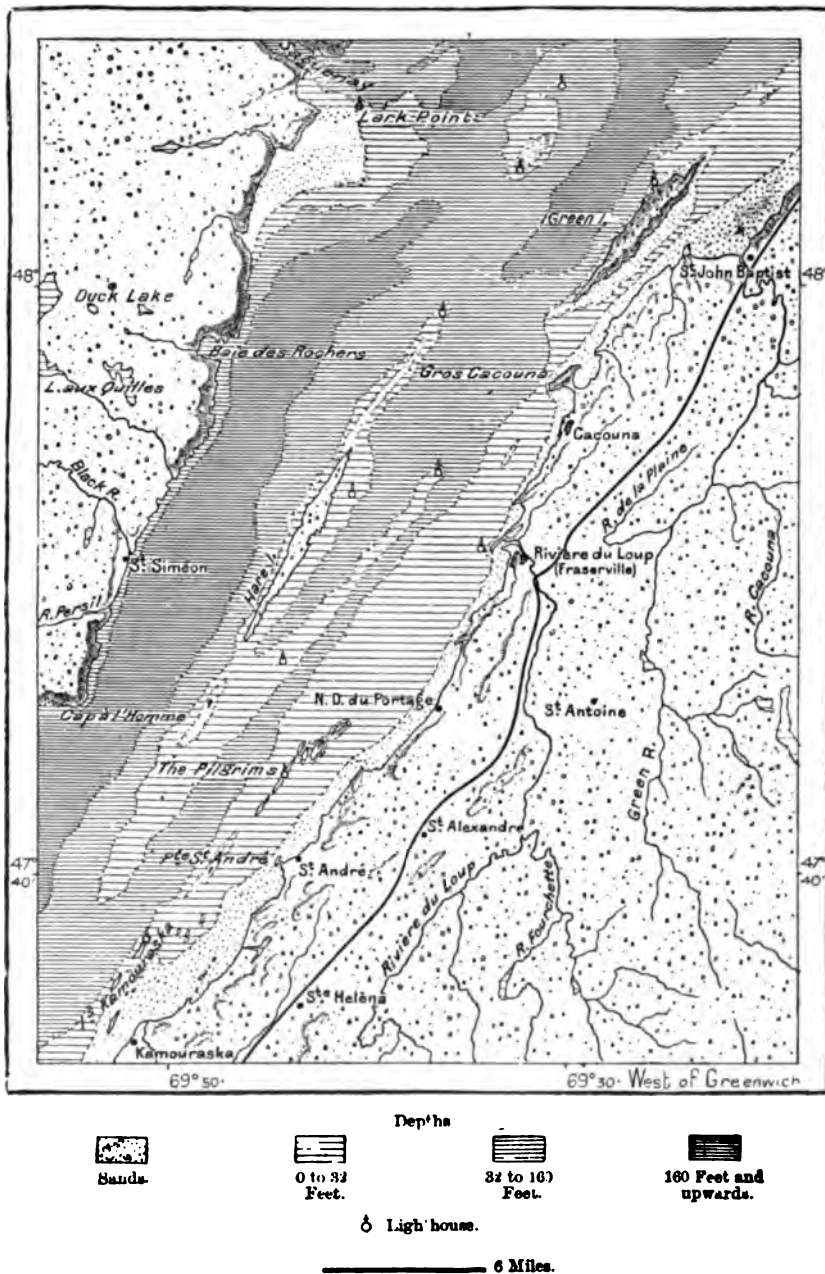
Lower down follows *Rivière-Ouelle*, a place ten times the size of the village of *La Ventrouse*, whence come the two chief families forming about half of the whole population. *Kamouraska*, on the same side, but nearer the coast, is a thriving watering-place much frequented during the season by visitors from Quebec and Montreal. In the vicinity flows the "Rivière aux Perles," where are found highly-prized pink pearls. Nearly opposite lies the inlet of *Mal Bay*, so named by Champlain from the dangerous eddies here formed by the tides. The English, who call it Murray Bay, selected it as the site of a Highland colony which has since been completely "Frenchified." Hotels, villas, and even schools and colleges have sprung up at the entrance of the valleys and on the terraced slopes of Mal Bay, which is much frequented by wealthy Americans resorting to the trout streams and lakes of the Laurentide uplands.

A railway will probably soon run from Mal Bay towards the Upper Saguenay, thus opening a relatively short route from Quebec to Lake St. John. The *Pointe au Pic*, and higher up *St. Paul's Bay* over against Coudres Island, are also

flourishing watering-places. The whirlpool of the "Gouffre," near Coudres Island, was till recently much dreaded by boatmen, but it is gradually silting up.

Fig. 145.—THE ST. LAWRENCE BETWEEN KAMOURASKA AND THE SAGUENAY.

Scale 1 : 480,000.



The neighbouring headland of the "Cap aux Corbeaux" ("Raven Cape") is said to have received its name from the carnivorous birds waiting for the bodies of the seafarers drowned in the whirlpool.

Rivière-du-Loup, the largest town of the lower St. Lawrence below Quebec, takes its name from a neighbouring stream which here develops a magnificent cascade. It has also been called *Fraserville* in honour of the old lords of the manor, who are still the most distinguished persons in the district. *Rivière-du-Loup* has in recent times acquired considerable importance as the converging-point of three main railways, the Grand Trunk, the Intercolonial, and the line running from the shores of Lake Temiscouata (the "Deep") in the direction of New Brunswick and the port of St. John's. Its staple industry is the manufacture of boots and shoes, and, thanks to its position on the estuary, it is rapidly becoming a popular bathing-place. But hitherto the Canadian fashionable world has shown a preference for the nearly circular beach of *Cacouna*, some six miles farther on. The word "*Cacouna*," which means "turtle," describes accurately enough the form of the bay, which is protected by a long high headland, connected with the mainland by a sandy neck like that of *Giens* or *Monte Argentaro*.

SETTLEMENTS IN THE SAGUENAY BASIN.

Over against *Cacouna* the St. Lawrence is joined by the Saguenay, a river the solemn grandeur of whose scenery never fails to impress all observers with feelings almost akin to terror. "Who has not heard of the Saguenay?" exclaims Mr. Stuart Cumberland, "that river which the early explorers thought led to the nethermost pit. For downright gloomy awfulness there is nothing to equal it in the world; and as the boat glides over the black fathomless water, through the chasm rent by angry nature in the frowning, cheerless rocks, one finds it difficult to overcome the first feeling of awe that the scene creates. With the fall of night, and with all brightness gone out of the skies, the surroundings assume an even more fearful aspect. From out of the inky darkness strange devilish forms seem to issue and flit in threatening attitudes before you, whilst from out of the depths of the impenetrable caverns, in accordance with your fancy, there come the despairing moans of souls lost in endless torture. The early settlers were at constant feud with the evil spirits of this most demoniacal river, and at its mouth they built a church—the first one in Canada—the ruins of which still exist."*

The region traversed by this remarkable watercourse is not, as was supposed by the early settlers, a "kingdom rich in gold and precious stones"; nevertheless, it supplies treasures of another kind, and the Hudson Bay Company, which inherited this "kingdom," was so jealous of its exclusive possession, that till the year 1838, no trapper was allowed to clear the land, cultivate the soil, or even fell timber; according to their claims, nobody had a right to touch "fur or fir" within these broad acres.†

Thus a region, which had already been partially surveyed by Normandin in 1735, lapsed into the condition of a *terra incognita*, and it is only within the present generation that the ploughshare has made its appearance on the shores of Lake

* *The Queen's Highway*, p. 388.

† Arthur Buies, *Le Saguenay et la vallée du Lac Saint-Jean*.

St. John. The first essays at colonisation, in 1848, were of a heroic character. It had long been known that the whole of the lacustrine basin was broadly girdled round by alluvial lands easily cultivable and highly productive, resting on a substratum of calcareous rocks. But how were they to be reached, lying as they did beyond the mountainous zone of the upper Saguenay and the Laurentide Hills, hundreds of miles from all highways. Yet daring pioneers, mostly from Mal Bay, Kamouraska, and other villages on the shores of the St. Lawrence, plunged into the unknown, remote from all their bases of supplies. Hewing their way through the woodlands, or stemming the swift currents on frail rafts, at last they reached a valley which seemed to have formerly been an emissary of the lake, and here they founded a settlement to which they gave the name of *Hébert-rille*, in honour of their pastor, at once their spiritual and temporal guide.

This was the parent colony, whence sprang all the other communes now fringing the southern and western shores of the lake. The marvellous salubrity of the land, where the birth-rate is fivefold higher than the mortality, contributes even more than direct immigration to its occupation. Despite the lack of roads and bridges, the forest clearings are steadily advancing round the northern and eastern margins, and in the near future the great inland sea will be completely girdled by a broad zone of villages and cultivated lands. The population is doubled from decade to decade, and during the fine season the district is resorted to by crowds of American anglers to whip the waters for the *wananish*, called in English the "land-locked salmon," though not a member of the salmonidæ. It is now proposed to regulate the level of the lake by sluices at the two "discharges" towards the Saguenay.

In the lacustrine basin the largest place is Roberval, named after an early explorer who traversed the Laurentide regions in the year 1542. The houses of Roberval are disposed along the sandy beach on the verge of a vast plain, now completely disafforested, for in the eyes of the settler "the tree is the enemy." Northwards rises a rocky eminence, a *cran*, as it is locally called, whence a wide prospect is commanded of the tilled lands about *Sainte-Prime* and other communes, last outlying stations of civilisation towards the north. Farther on, the only habitations are those of a few Montagnais Indians, and beyond Hudson Bay those of the Eskimo fishers.

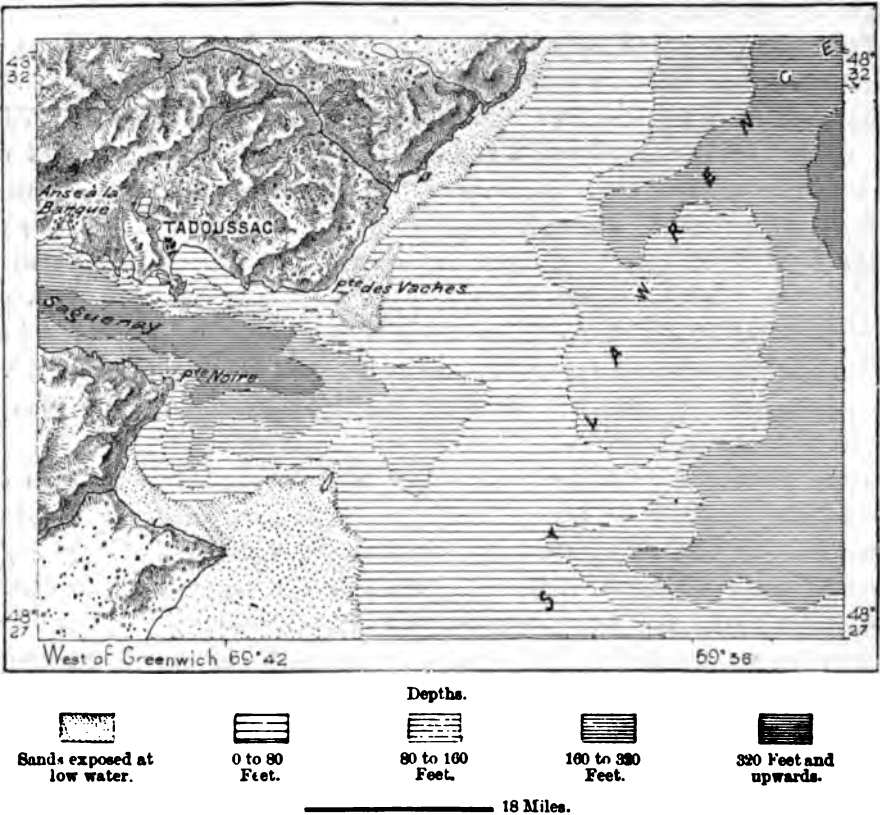
East of the "cran" of *Sainte-Prime*, a terrace named *Pointe-Bleue* has been reserved for the Lake Indians; the lands granted to them are amongst the best in Canada, and the forests, by which they are partly overgrown, have recently been destroyed by a fire. The whites are forbidden to encroach on this tract, where a little rudimentary agriculture is practised by a few half-breeds. They still live mainly by fishing and hunting, and the bow and arrow are the characteristic toys of their children. Nearly all the Montagnais of this reserve have erected their tents, their shanties and stacks on the margin of the lake, grouped round about a chapel whose altars, decorated with banners and artificial flowers, they are proud of showing to strangers. There are few more pleasant sites than that of la *Pointe-Bleue*, where the path winds along the cliff below its maple, wild cherry,

and aspen groves, between which vistas are afforded of the glittering lake with its creeks and inlets, its white sandy beach and wooded islets.

The port of the St. John district and of the upper Saguenay basin is the thriving town of *Chicoutimi*, on both banks of the river of the same name, at the head of the navigation. The Kree name of the place, "Depth so far," answers exactly to the conditions, although steamers have to await the flood tides to reach the station. A busy lumber trade is carried on along the banks of the Saguenay below its confluence with the Chicoutimi, which descends through a series of

Fig. 146.--TADOUSSAC AND THE SAGUENAY CONFLUENCE.

Scale 1 : 20,000.



rapids from the deep Lake Kenogami. The last cascade, 40 feet high, occurs just above the confluence, and the roar of its foaming waters is heard in the town itself. The lumber trade is here monopolised by a single family, owners of nearly all the surrounding forests. Above the town stands an obelisk, raised in honour of the "father of the Saguenay," that is, the speculator who has managed to control, for his own benefit, the joint labour of all the riverain populations. At Chicoutimi much of the lumber is shipped for export, chiefly by Norwegian brigs. Farther down, Ha-Ha Bay is fringed by a few villages above the deep gorges of the Saguenay.



FALLS OF THE CHICOUTIMI, NEAR THE SAGUENAY CONFLUENCE.

Tadoussac, at the confluence of the Saguenay and St. Lawrence, and on the left bank of both rivers, has acquired some importance as a port of call for steamers, and as a summer resort frequented especially by Americans; but as a trading-place it has not justified the hopes of the early French navigators. In 1599 Chauvin here landed a few men and founded a temporary settlement; a few years later it became a regular factory where the Montagnais came to barter their peltries, and for a long time the colonisers of Canada hesitated between Tadoussac and Quebec before they finally decided in favour of the latter as the centre of the administration. At present the chief industry of Tadoussac is pisciculture, carried on in the *Anse à la Barque*, a basin where as many as two millions of salmon fry are annually reared.

It has often been proposed to establish a winter harbour at the foot of the headland on the right side of the Saguenay over against Tadoussac. At this point the water never freezes, as it does at Quebec and Montreal, and the Atlantic liners might anchor here, instead of stopping short at the outer ports, such as Halifax or St. John.

STATIONS BELOW TADOUSSAC.

Beyond Tadoussac the left side of the St. Lawrence presents nothing but a few scattered habitations. Here the river valleys are narrow, the mountains steep, the climate severe, while the vegetation of this rugged region is parched by the formidable north-east winds. A few missionary stations, round which are grouped the Indian huts, a number of factories, maintained by the Hudson Bay Company for the purchase of peltries, lighthouses, and sheds for fish-curing, occur at intervals along the coast as far as the *Blanc-Sablon* creek, which marks the frontier between the province of Quebec and Labrador properly so called. In the current language, however, the Canadians apply the term Labrador to the part of the seaboard which extends north of the estuary and gulf of St. Lawrence as far as Belle-Isle Strait.

Despite its rude climate daring men do not fear to settle on the seaboard, and this "Labrador" is spoken of as a promising region for future colonisation. A few hamlets have already been founded here and there by Acadians from the Magdalene Archipelago, and by other pioneers from the opposite Gaspé peninsula; the population, though scanty, is nevertheless doubled every ten years. One of the chief stations is the mission of *Betsiamite* or *Bersamis*, a village of Montagnais and half-breeds on the north side of an estuary here joined by the Betsiamite river, which is navigable by small craft for a distance of about 30 miles. Before 1844, when the Catholic missions were re-established, the Montagnais had relapsed into heathendom, and many of these Indians are still pagans.*

Moisie, at the mouth of the river of like name, is also mentioned as one of the places whose position holds out promise of future commercial prosperity; it has often been proposed to utilise the neighbouring sands, which contain a large

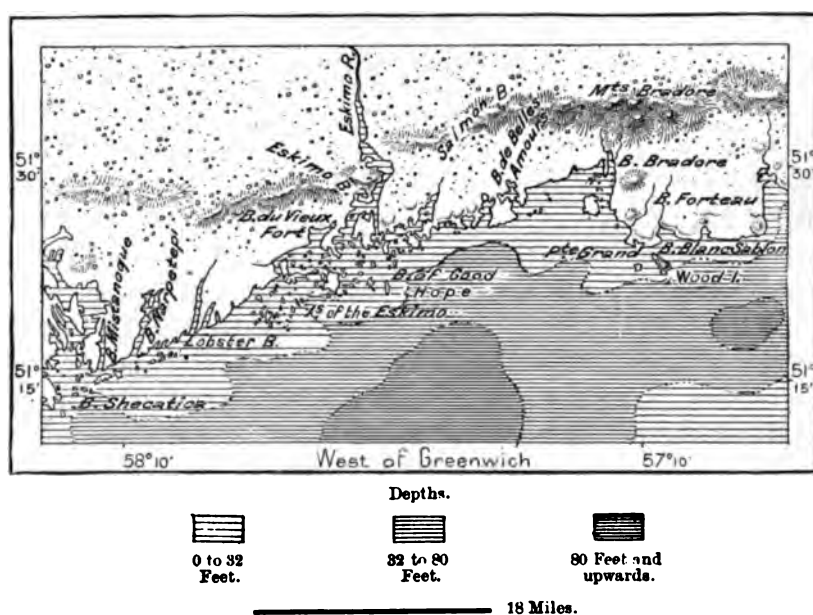
* C. H. Farnham, "The Montagnais," *Harper's New Monthly Magazine*.

proportion of magnetic iron. Another place of future promise is the hamlet of *Mingan*, which faces the Mingan Archipelago opposite Anticosti.

The lands about the mouth of the St. Augustine river are said to be highly productive by their few occupants, and the valley might certainly furnish for export considerable quantities of timber. Lastly, near the entrance of Belle-Isle Strait, follow the stations of *Eskimo Point*, *Good Hope*, *Belles-Amours*, *Bradore*, and *Blanc-Sablon*. Should a town ever rise on the shores of Bradore Bay, it may claim to stand on the site of the oldest settlement in Canada. In 1508, that is, a century before the foundation of Quebec, here stood the Breton town of *Brest*, which during the fishing season had a floating population of as many as 3,000 souls.* But the royal monopoly granted to the Governors of Canada

Fig. 147.—ESKIMO RIVER AND BRADORE BAY.

Scale 1 : 1,600,000.



nipped the little republic in the bud. In the vicinity are still seen a few remains of old structures, some of French, some of Eskimo origin.

THE GASPÉ PENINSULA.

The right side of the Gulf of St. Lawrence is less of a solitude than the Canadian-Labrador coast. Here have been founded the little villages of *Trois-Pistoles*, *Bic*, *Rimouski*, *Mitis*, and *Matane*, all situated at the foot of the coast range. Rimouski, at present merely a landing-stage, hopes one day to become a large place, thanks to its fine harbour; here the Atlantic packets stop to land and receive the European mails, and Rimouski is also the first or last point of the

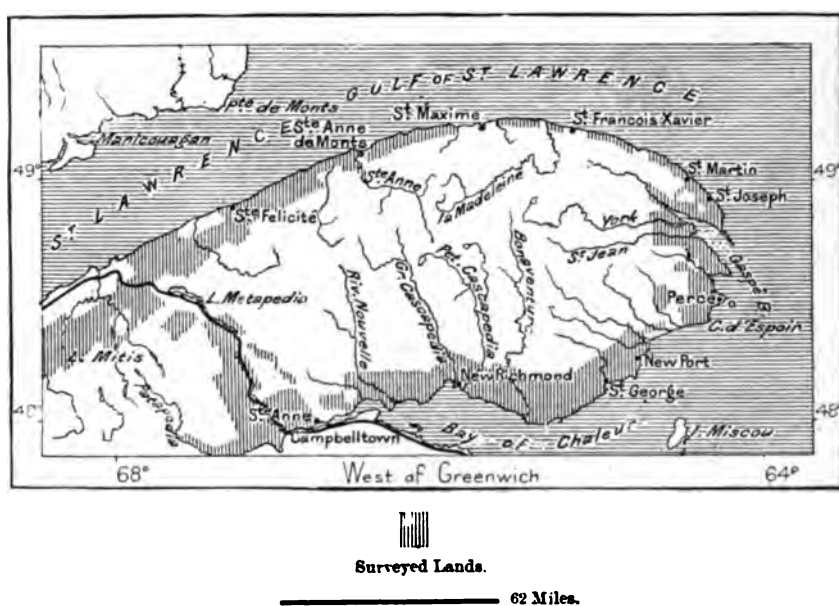
* *Quebec Literary and Historical Society*, 1841; Benjamin Sulte, *Histoire des Canadiens français*.

continent reached or quitted by passengers. Beyond it as far as the Newfoundland waters nothing is visible except the long low line of the almost uninhabited shores of Anticosti. Till recently the only occupants of this large island were a few salvage men and lighthouse keepers, and the only cultivated lands the little garden plots round their dwellings. Formerly seafarers wrecked on these inhospitable shores were often reduced to the direst distress, resorting even to cannibalism to preserve their lives.* The chief settlement, composed exclusively of Franco-Canadians, lies near the western extremity.†

The southern slope of the Gaspé peninsula, which is washed by the Gulf of St. Lawrence, is indented round the coast by numerous fjords, whose harbours have attracted a few groups of population. Gaspé (Gihakspek, or Montagnais)

Fig. 148.—SURVEYED AND ARABLE LANDS OF GASPÉ.

Scale 1 : 3,500,000.



is a sort of Finisterre, or "Land's End," analogous to the western extremity of Brittany, or the terminal peninsulas of Spain and England. Hence this advanced promontory of the continent has played a certain part in the history of geographical research. Jacques Cartier landed here; here also Roquemont lost a fleet, captured by the English, and other naval battles were fought in the neighbouring waters.

At present the Gaspesians are occupied chiefly with fishing and navigation. The interior is a complete solitude, so bleak, rugged, and barren that the surface has not even yet been officially surveyed. The little station of *Gaspé* stands

* Shipwrecks on the coasts of Anticosti from 1870 to 1880: 106 vessels, manned by 2,000 hands, of whom 300 perished. (J. U. Gregory, *L'île d'Anticosti et ses Naufrages*.)

† Faucher de Saint-Maurice, *De tribord à bâbord*.

on a creek near the head of the spacious inlet of Gaspé Bay, and its harbour offers certain advantages for the projected winter station for transatlantic steamers.

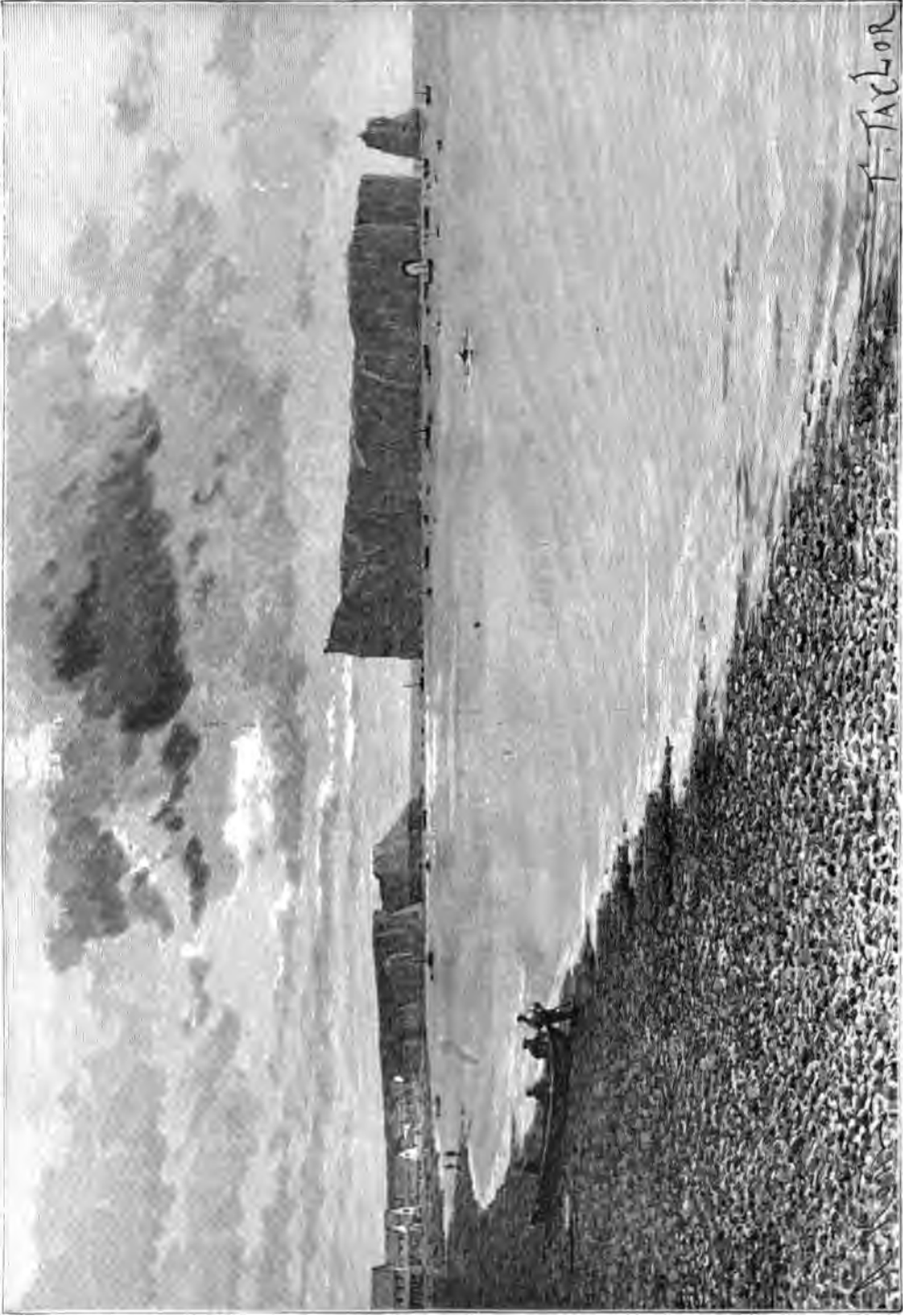
Another inlet a little farther south has been well named Mal Bay from its

Fig. 149.—EXTREMITY OF THE GASPÉ PENINSULA.

Scale 1 : 600,000.



dangerous reefs and banks. Near the south-east approach the village of *Percé* stands on the rocky shore at the foot of the lofty headland of St. Anne, whose natural curiosities render it one of the most remarkable spots on the North

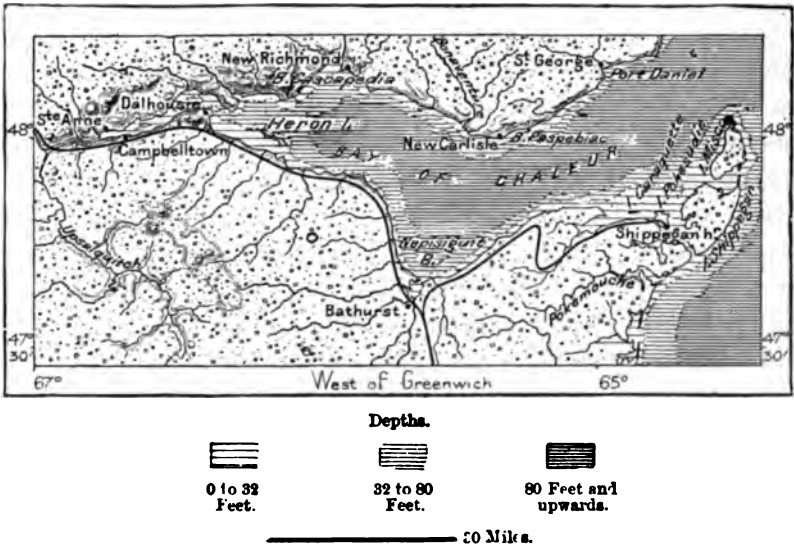


THE ROUTE PERCÉE AND PERCÉ VILLAGE.



American continent. Off the coast the red conglomerate cliffs of Bonaventure Island rise to a height of 330 feet out of deep water. The *roche percée* ("pierced rock") which gives its name to the village, is all that now remains of the isthmus by which Bonaventure was at one time connected with the mainland. Its rocky walls have been excavated to such an extent by the waves that the overhanging cliffs and cavern are high and spacious enough to give access to a vessel in full sail at high water. The cliff itself is attached to the mainland, but an isolated obelisk stands on a rocky pedestal exposed to the full fury of the surf. Nobody is allowed to scale the rock for fear of disturbing or driving away the aquatic fowl which resort in myriads to this breeding station. One section of the heights belongs to the cormorants, the other to the gulls, and all attempts of either party to encroach on its neighbours' domain give rise to fierce battles.

Fig. 150.—BAY OF CHALEUR.
Scale 1 : 2,000,000.



Despite the romantic beauty of its surroundings, Percé fails to attract visitors, who are repelled by the intolerable stench of the cod here used to manure the ground. "At Percé," says a proverb, "the potatoes have codfish bones."

CHALEUR BAY.

A short distance south of Percé stands the low headland of Cape d'Espoir ("Cape of Hope"), of which by a curious popular etymology the English have made *Cape Despair*, a name too well justified by the numerous shipwrecks on this coast. Nevertheless, this cape marks the entrance to the magnificent inlet to which Jacques Cartier gave the name of *Baie des Chaleurs* (Chaleur Bay). His visit took place in 1535, but it had probably already been discovered by the

Spanish navigators, for a "Spanish Bay" is figured on the old maps on this part of the coast.

Chaleur Bay opens like a second Gulf of St. Lawrence to the south of Gaspé Bay. Round its whole extent it is encircled by ranges of dome-shaped undulating hills pierced at intervals by the mouths of numerous streams here reaching the coast. Although occasionally ruffled by storms, the bay is usually tranquil, with clear skies free of fog, and slight tidal currents accompanied by scarcely perceptible eddies. It abounds in cod, herring, and other fishes, whence its Mic-Mac name, "Fish Sea," one far more justified than its French designation, for it has at times been completely frozen over.

These waters are visited by some American fishers whose captures are intended chiefly for the New England markets; but for over a century most of the fishing-smacks have been owned by a Jersey family succeeded by a financial company, and this feudal system still persists almost intact. The fishermen being encumbered with debt for the loans advanced to them by the speculators, could scarcely attempt to get rid of these burdens without being declared insolvent by the courts.

In this land of legend and weird memories Chaleur Bay could not fail to be associated with some supernatural manifestation. Here it assumes the form of a "phantom light," which, like similar phenomena elsewhere, is spoken of by everybody, but actually seen only by a favoured few. It is said to flit about in various parts of the bay, now under one form, now under another, at one time resembling a great ball of fire within a mile or two of the shore, at another assuming the appearance of a burning vessel many miles away. "Sometimes it shoots like a meteor, at others it glides along with a slow and dignified motion. Sometimes it seems to rest upon the water; sometimes it mounts rapidly in the air and descends again. It is altogether mysterious and eccentric.

"The light is generally followed by a storm, and, as an instance of its mysteriousness and eccentricity, it on one occasion, I am assured, actually appeared above the ice in the depth of winter.

"I have watched more than once for a sight of the phantom, but luck was never with me, and I can therefore offer no personal opinion with regard to it.

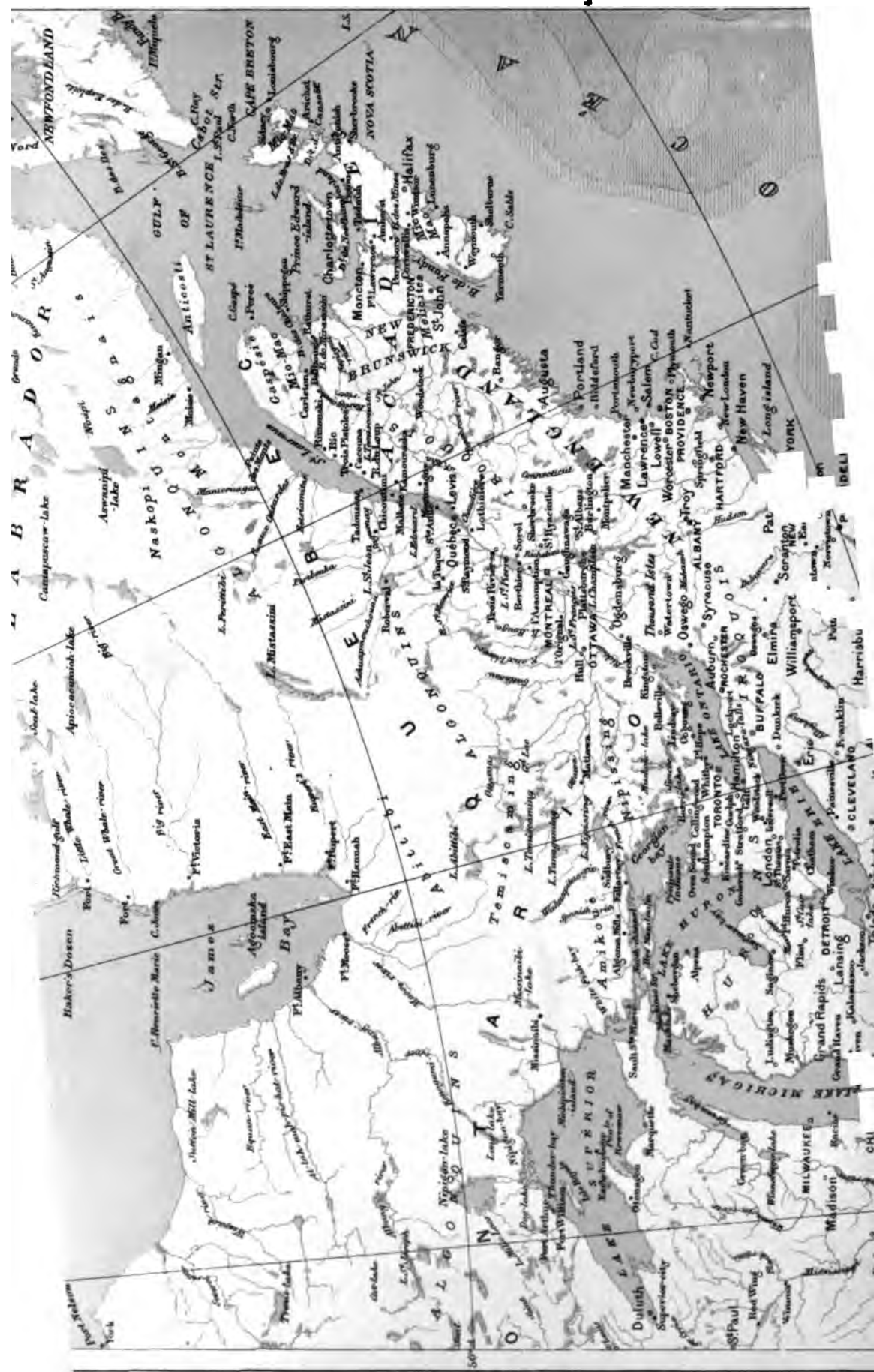
"In conclusion I may, however, say that amongst the simple fishing folk there is a tradition that some three-quarters of a century ago the crew of a vessel lying in the bay mutinied, killed their loyal companions, and plundered the ship. In making off with the plunder, however, they were wrecked off the coast and drowned, having been led to their destruction by a mystic light which appeared for the first time in the memory of man.

"This is all very well, but why this light continues to appear after it had effected its purpose is not at all clear."*

The towns and villages on the coast, such as *Paspébiac*, or *New Carlisle*, *Carleton*, *Campbelltown*, and *Dalhousie*, are grouped round the large establishments where the fish is cured. As many as 1,500 smacks, manned by 2,800 hands, are

* Stuart Cumberland, *op. cit.*

[illegible]



engaged on these waters, and the yearly captures are estimated at about £160,000. Chaleur Bay, and its affluent, the Restigouche, with the tributary, Metapedia, serve as the common limits of the provinces of Quebec and New Brunswick.

THE MAGDALEN AND BIRD ISLANDS.

To the province of Quebec also belong the Magdalen Islands in the St. Lawrence Gulf, which lie nearer to Cape Breton and Newfoundland than to Gaspé Land, but are nevertheless inhabited exclusively by French Canadians. At the time of the cession of Canada to England, the archipelago contained a population of less than a hundred fishers. They have since multiplied forty or fiftyfold, and have moreover sent colonies to distant places, notably the Canadian coast of Labrador and the Mingan Islands. In the year 1882 as many as 120 families emigrated to these districts. Want of room has not been the only cause of this movement. The inhabitants also complained of being little better than the serfs of a great landowner, an American citizen, to one of whose ancestors the Governor of Canada had assigned the lordship over the archipelago.

Formerly the Magdalen Islands were like a little Greenland, their waters abounding especially in walrus and seals. But the walrus had already completely disappeared by the end of the eighteenth century, and the seals are less numerous, although thousands may sometimes be seen on the ice-floes driven by the winter gales against the shores of the archipelago. At present cod and lobsters are the chief resources of the islands, the latter being taken in large numbers and forwarded chiefly to the States. Considerable quantities of eggs and feathers are also yielded by the Bird Islands, a little group of red sandstone rocks lying some distance north of the Magdalen Islands. Here the chief village lies on the south side of Amherst, the southernmost member of the Archipelago.

VI.—THE MARITIME PROVINCES.

(NEW BRUNSWICK, NOVA SCOTIA, PRINCE EDWARD ISLAND.)

This section of the Canadian confederacy constitutes a perfectly distinct physical region, except at the north-west corner where the frontier is indicated only by conventional geometrical lines. But none of the rivers traversing New Brunswick belong to the Laurentian basin, all flowing in independent channels to the Atlantic. A height of land or waterparting, clearly indicated either by plateau ridges or by mountain ranges, separates the basin of the St. John from that of the great Canadian river.

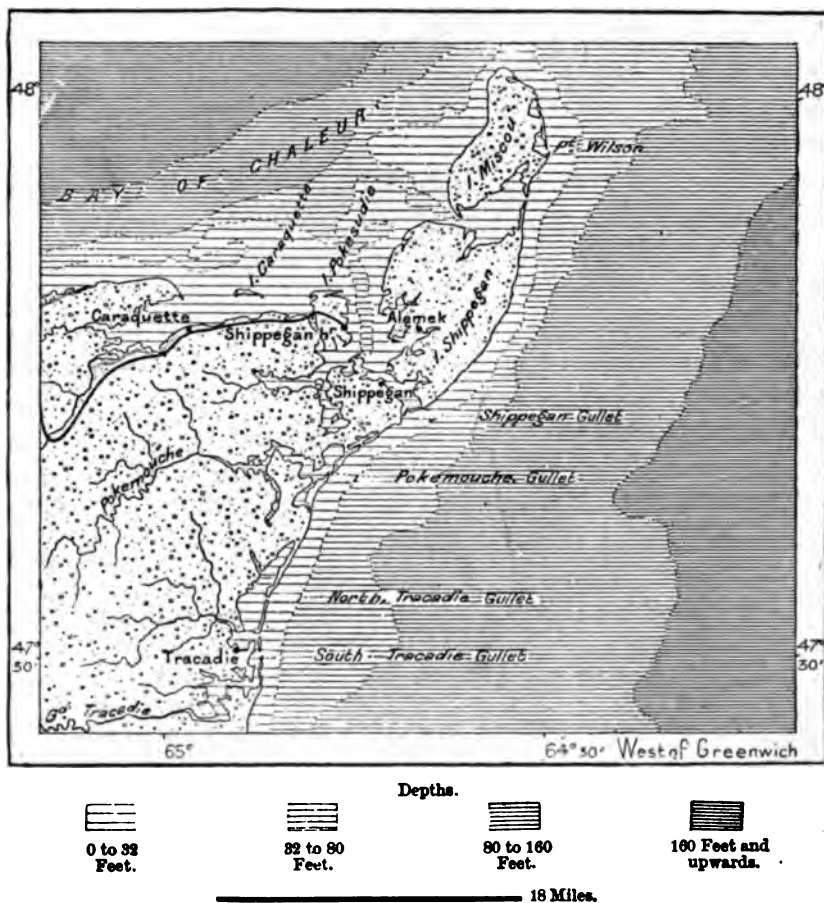
GENERAL SURVEY.

Regarded as a whole, these maritime provinces belong to the same natural region as New England, while the solitudes separating them from the province of Quebec coincide with the watershed. The limits determined by the vicissitudes

of war and by diplomacy are far from following those indicated by nature, and in order to remedy this violation of the geographical conditions, the Canadian Government has been obliged to construct at great expense the "Intercolonial" trunk line of railway traversing uninhabited and almost uninhabitable wastes. A mere glance at the map suffices to show that the Maritime Provinces form an abnormal appendix to the other Canadian regions. A division more in accordance

Fig. 151.—SHIPPEGAN PENINSULA AND ISLAND.

Scale 1 : 750,000.



with the natural relations would have either awarded New Brunswick to the United States, or Maine to the Dominion.

The contour lines and relief of New Brunswick and Nova Scotia are determined by the general trend of the Appalachian orographic system, being disposed like it mainly in the direction from south-west to north-east. Thus the terminal horn of the Shippegan Archipelago projects north-eastwards into the Gulf of St. Lawrence, and the other headlands of New Brunswick, Prince Edward and Cape Breton all point in the same direction, which is also that of the elongated Magdalen Archipelago in the middle of the gulf.

During the first period of colonisation and conquest, long before there could be any question of delimiting these scarcely known territories, they were collectively known by the name of Acadia or Cadia, derived from the Indian word *cody* or *quoddy*, which, according to most etymologists, has simply the meaning of "country." After the British occupation this name fell into abeyance, but it is now proposed again to revive it as the general designation of the three maritime provinces. These minor states, acting separately in the councils of the Dominion, have too little influence to enforce their views; but when grouped together they hope to exercise as much authority as the other members of the Confederacy, and even at times control the majority by their casting vote.

But, however this be, their relative influence must always depend on the number of inhabitants, and this number is far from increasing as rapidly as that of the other provinces despite their favourable commercial position in that part of America which lies nearest to west Europe.

PHYSICAL FEATURES OF NEW BRUNSWICK.

The mean elevation of New Brunswick is certainly low, and the highest point in the whole region probably falls below 3,300 feet. The Bald Mountain, a cone-shaped trappean rock, which dominates all the other summits in the north-west district, is only 2,470 feet high, and the rounded crest of the Blue Mountain farther south in the same range has an absolute altitude of less than 1,600 feet, rising about 760 feet above the surrounding lake-studded valleys. Hence these heights appear as mere hills of slight elevation, and their slopes and escarpments are almost everywhere forest-clad. It would be difficult anywhere to find an eminence affording an extensive view, except, perhaps, in the vicinity of the sea, where a few bold headlands rise above the waves and neighbouring archipelagoes.

From the general aspect of the land geologists find some difficulty in determining the character of the rocks, except where they are exposed in the river gorges or railway cuttings. The surface soil, which must be removed to reach the substratum, is usually covered with a green mantle in summer and a white in winter. This surface soil consists chiefly of glacial deposits and clays, while nearly all the underlying rocks appear to belong to the paleozoic and carboniferous epochs. All the central and north-eastern districts are formed of strata dating from the coal age and remarkable for the regularity of their horizontally stratified rocks. There are no hills, and only here and there a few depressions filled with peat, swampy or lacustrine waters. The coal beds themselves are usually thin and of small extent, but interspersed with them are also minerals, gypsum, native salt, while they are covered with a soil admirably suited for the cultivation of fruit trees and cereals. Hence the carboniferous region is also the chief agricultural domain in New Brunswick.

West of the coal measures a narrow belt of igneous formations runs south-west and north-east parallel with the general trend of the Appalachian system.

THE NEW BRUNSWICK INTERVALS.

Along most of the New Brunswick rivers are found extensive low-lying tracts, which consist of alluvial deposits, and are locally known by the name of "the intervals." They have a surface layer of rich loam, easily worked and resting on a substratum of clay or sand. Some of these fertile tracts stand above the level of the highest floods, while others are periodically inundated by the spring freshets. Nearly all the islands in the rivers are of like formation, and a large portion of the intervals, which in some instances extend for over a mile back from the river banks, has already been brought under tillage. In some places the intervals rise in terraces to the slopes of the surrounding hills, so that here the lower cultivated and annually inundated lands are succeeded by other arable tracts rising above the reach of the highest floods. But all alike are equally productive, whether they occur along the main rivers or in the valleys of their smallest affluents.

Before they were cleared for cultivation these intervals were often densely wooded, and almost everywhere overgrown with a rich and varied vegetation. Referring to their appearance at that time, Dr. Bailey, of the New Brunswick University, remarked that, "these interval lands, while they forbade any attempts at geological exploration, could scarcely fail to attract attention for their evident fertility, and for the very remarkable luxuriance of their vegetation, elms and mountain ash attaining an enormous growth, arbor vitæ, spruce, fir, birch, and poplar being very numerous, while the shrubs, herbs, and ferns, some of the latter attaining a height of four or five feet, were generally of a kind to indicate great fertility of the soil supporting them."*

PHYSICAL FEATURES OF NOVA SCOTIA, CAPE BRETON, AND PRINCE
EDWARD ISLAND.

Gradually contracting between the Gulf of St. Lawrence and the Bay of Fundy, the whole region is reduced at its narrowest point to an isthmus 15 or 16 miles wide, which rises little above the surrounding seas. The line of demarcation, drawn at this point between New Brunswick and Nova Scotia, represents no geological division, for the carboniferous formation is continued east of the isthmus in the Acadian peninsula, where it develops extremely thick beds of excellent fuel which is worked chiefly in the northern districts.

As in New Brunswick, these Acadian coal-fields are very flat; the eminences rising above them belong to other formations, partly igneous, partly paleozoic. Most of the higher summits of volcanic origin occur in the so-called Cobequid "Mountains," which begin at the headland projecting between the two basins at the head of the Bay of Fundy, and run thence eastwards parallel with Prince Edward Island, ranging in height from about 900 to a little over 1,000 feet.

The eminences occurring elsewhere in Nova Scotia are even lower, but they are disposed in a line with the main axis of the peninsula, and at many points

* Dr. Bailey, *Official Report*, 1864.

present a superb appearance seen from the inlets washing their base. Lastly the eastern shores of the Bay of Fundy are skirted by a double chain of eruptive rocks, the "North Mountains" and the "South Mountains," between which the bay communicates through the Annapolis Gut with an inner basin.

In Cape Breton, which forms a northern extension of Nova Scotia, the only marked rising grounds are a few silurian heights in the north, for the most part deeply ravined and of difficult access.

Prince Edward Island, whose irregular crescent is developed parallel with the

Fig. 152.—CARBONIFEROUS DISTRICTS OF NOVA SCOTIA AND NEW BRUNSWICK.

Scale 1 : 7,000,000.



contours of the Gulf of St. Lawrence, is a low-lying region almost divided into separate masses by the deep bays and inlets indenting its northern and southern shores, and at some points nearly meeting in the interior. A very slight subsidence would transform the island into an archipelago. The waters, which, by their erosive action, have separated Prince Edward from Nova Scotia and New Brunswick, have evidently followed an original fault in the terrestrial crust, dating from a very remote epoch. The island belongs geologically to a different

system, being of triassic origin and presenting no trace of the carboniferous rocks characteristic of the opposite mainland.

The coal measures of Nova Scotia and Cape Breton have a collective area of 325,000 acres, and contain a supply of fuel estimated at about 4,000 millions of tons, enough to supply the present consumption of Great Britain for over thirty years.

Throughout the whole of these lands, situated at the Atlantic extremity of Canada, glacial action is everywhere conspicuously evident. The soil is covered to a great depth with the débris of ancient moraines, clays, and boulders, the faces of the rocks presenting regular striations, according to which the glaciers would appear to have moved in the direction from north to south or south-east. In many valleys, notably in that of the St. John, the drift did not follow the present course of the streams, but moved even athwart their beds.* Hence the general geographical disposition of the fluvial valleys must have changed since the glacial epoch.

The drift gravels contain a certain proportion of gold derived from the hard rocks of the neighbouring mountains, but the recent alluvia are found to be far less rich in the precious metal. Nova Scotia possesses some productive mines, but in the neighbourhood of these deposits gold-dust has in vain been sought in the sands of the running waters. Its absence is explained by the recent passage of the glaciers. The streams would appear to have acted somewhat like the gold-hunters themselves, carrying seawards the clays, sands, comminuted particles, and leaving behind the heavier gravels and the residuum of the precious metal. The glaciers on the contrary carried away both gravels and gold-dust. Certain graded terraces skirting the New Brunswick rivers seem to show that, since the glacial epoch, the level of land and surrounding waters has changed several times.†

RIVERS AND LAKES OF NEW BRUNSWICK.

South of the St. Lawrence the most copious stream in the Dominion flowing to the Atlantic is the St. John, which was formerly called the Lushtuk, or "Long River," and which has a total length of about 450 miles. Some of the head waters have their source in the dorsal ridge which skirts the left bank of the St. Lawrence at a mean distance of from 12 to 15 miles. To the St. John basin belongs the little Lake Madawaska (St. Francis), near Rivière-du-Loup; but the Wollastook, or main upper branch, has its origin in a depression which is much farther removed from the St. Lawrence, and which is developed in the direction from south-west to north-east parallel with the fluvial valley. This direction is followed as far as the Madawaska confluence, where the St. John trends eastwards, and then south-eastwards to its estuary in the Bay of Fundy. Along its course it receives the waters of numerous lakes both in the Canadian and United States mountains, which send their overflow to both banks through many cascades and rapids.

* Matthew, Hunt, Dawson, and others.

† Thomas Belt, *Glacial Period in North America*, Transactions of the Nova Scotia Institute of Natural Science, 1866.

In its upper valley the St. John itself develops the finest falls in New Brunswick. Below a deep expanse of smooth water, the stream disappears in a narrow gorge, and after sweeping down a steep incline plunges with a drop of 60 feet over a limestone barrier. Right and left numerous little cataracts, tumbling headlong from the lateral projections, merge in the foaming channel of the main stream. Beyond this chasm the rapids are continued for over half a mile to another expanse, where the snags sent down from above are seen whirling round in the eddies.

Farther down the St. John receives its two largest affluents, the Aroostook, which joins its left bank from the State of Maine, and the Tobique, descending on the opposite side from the hills encircling the Bay of Chaleur. Alpestrine scenery now gives place to soft and charming landscapes, where the meandering stream winds placidly between rounded grassy or wooded hills.

Here and there traces may be seen of old beaches along the slopes of the valley, and considerably higher than the present fluvial level. Such water-marks attest the great changes that have taken place in recent geological times in the relief of the land. But the great extent of these changes can best be studied in the lower reaches, where the St. John expands into a broad estuary navigable by vessels of heavy draught. Along the whole of the New Brunswick coastlands the rocky heights are disposed parallel with the Bay of Fundy and with Nova Scotia, in a line with the main axis of the Appalachian Mountains. This general disposition of the ridges from south-east to north-west opposed a physical impediment to the seaward course of the St. John; the consequence is that above each rocky barrier the river and its affluents have formed extensive lacustrine basins.

Four large lakes thus follow each other east of the lower St. John, flooding parallel valleys between the coast chains. At the very mouth of the river is developed a marshy expanse with a creek which seems to have been the former fluvial channel. The present mouth has been formed by the rupture of a rocky limestone barrier, whose walls are now seen rising about 100 feet above the surface. This breach in the rock-bound coast presents a unique phenomenon. At low water the St. John, confined to a channel 460 feet wide, descends to the basin through two falls, the higher of which forms a uniform sheet 24 to 26 feet high. As the tide rises the lower cascade is gradually effaced, and then the base of the second becomes swamped, as it were, the outer or landward attaining the same level as the seaward current. The two streams become intermingled in conflicting eddies, and during exceptionally strong tides the cascade becomes, so to say, reversed, the tidal stream rushing up the bed of the river sometimes as far as the capital, 80 miles inland.

During the short period of equilibrium between the two levels steamers are able to penetrate from the roadstead into the St. John, whose course is navigable for over 250 miles from the sea. Formerly the Indians and Canadian trappers ascended it as far as a portage, whence they crossed into the St. Lawrence basin, reaching Quebec by the bed of the Chaudière River. The St. John, like the St. Lawrence, becomes a source of danger to the riverain populations by the jamming

and bursting of its icy fetters. Thus in 1831 the frozen masses suddenly burst above the narrows at Fredericton, and, getting jammed in this gorge, they became piled up in an immense dam, causing the river to flow back and threatening the town with complete destruction.*

No other New Brunswick stream can compare with the St. John in size or volume, although others also send down a considerable current and are even navigable for some distance from the sea. In the north the long estuary of the Bay of Chaleur, which reproduces on a smaller scale that of the St. Lawrence, receives the waters of the Restigouche ("Five Fingers"), a large stream which has been selected as the frontier towards the province of Quebec. In the south an inlet from the same estuary takes its name from the Nipisquit (Nipisquit), a considerable affluent from the south-west, which, like the St. John, has also its "grand falls."

The extensive plains between the St. John and Nipisquit basins are traversed by the various streams whose united waters form the Miramichi, which reaches the east coast at Miramichi Bay, a broad inlet sheltered at its mouth by a cluster of islets. The Miramichi basin, which is next in importance to that of the St. John, lies entirely within the province of which it occupies all the central parts. Its estuary is perfectly safe, and the lower reaches are deep enough for large steamers to ascend some miles inland. At a short distance from the coast the main stream ramifies into two branches, which are again subdivided into several secondary channels branching off in various directions. The farthest headstream, whose waters appear to intermingle at some points with those of the St. John affluents, takes the name of the South-west Miramichi, and rises near the United States frontier. It flows for over 80 miles through a comparatively settled and productive region, though even here extensive tracts of good land still remain unoccupied. All the other tributaries, such as the North-west Miramichi, the "Little South-west," the Renous, the Cain's River, and the Bartholomew, are navigable by boats of light draught, and settlements have already been formed on many of the "intervals" traversed by them. All the streams forming the wide-branching Miramichi system flow through a region of great fertility, abounding in fine forest and pasture lands. Extensive lumbering operations are carried on, especially about their sources, the logs being floated down to the saw-mills, which are kept constantly at work at Chatham, Newcastle, and other flourishing places about the estuary.

The St. Croix, which flows to Passamaquoddy Bay, forms the political frontier towards the State of Maine. It is a considerable stream, receiving the overflow of two chains of lakes, one of which lies beyond the frontier in the State of Maine, while the other forms with the river the boundary between that state and New Brunswick. The St. Croix is navigable as far as St. Stephen, which lies about 16 miles from its mouth at the head of the tidal waters. The estuary in Passamaquoddy Bay forms one of the finest harbours on the whole of the north-east seaboard. This harbour of St. Andrews, as it is called from the neighbouring

* A. Leith Adams.

town of that name, has an area of about 100 square miles, is well sheltered by the West Isles, which form a natural breakwater at its entrance, and has the great advantage of good anchorage almost completely free from obstruction by ice throughout the year.

Altogether New Brunswick enjoys an unusual extent of navigable waters, flowing almost entirely through wooded or arable lands of great fertility, and developing spacious and well-sheltered harbours at their tidal estuaries.

Nova Scotia, Cape Breton, and Prince Edward Island are too contracted to develop large watercourses; but many of the streams expand into broad estuaries at their mouth. Both on the north and south sides the maritime provinces are deeply indented by such estuaries and other inlets, which were, perhaps, ancient fjords, but which have long ceased to present the typical aspect of such formations. They nowhere show the meandering course, precipitous walls and deep channels characteristic of the Alaskan sounds and inlets, the contour lines and general relief having been, during the course of ages, profoundly modified by erosive action.

SOUNDS AND INLETS.—BAY OF FUNDY.

In the north the great circular current of the Gulf of St. Lawrence, which penetrates into Northumberland Strait between Prince Edward Island and the mainland, has sculptured the seaboard in the direction from north-west to south-east. But on the opposite side the waters entering the Bay of Fundy and setting south-west and north-east, have enlarged the fluvial valleys opened in that direction between the parallel spurs of the main mountain ranges. In Northumberland Strait, a comparatively shallow depression in the earth's crust, the average depth varies from 50 to 60 feet, sinking in the cavities to about 100 feet. The curious Bras d'Or, or better, Brador Lake, which occupies a large part of Cape Breton, affects the form of a horse-shoe, opening northwards through a double channel. This basin has better preserved its primitive character of a fault in the terrestrial crust, its north-east entrance, called "Little Brador," developing a narrow gorge between the cliffs, while in the basin itself depths of over 100 fathoms have been recorded in the deeper troughs.

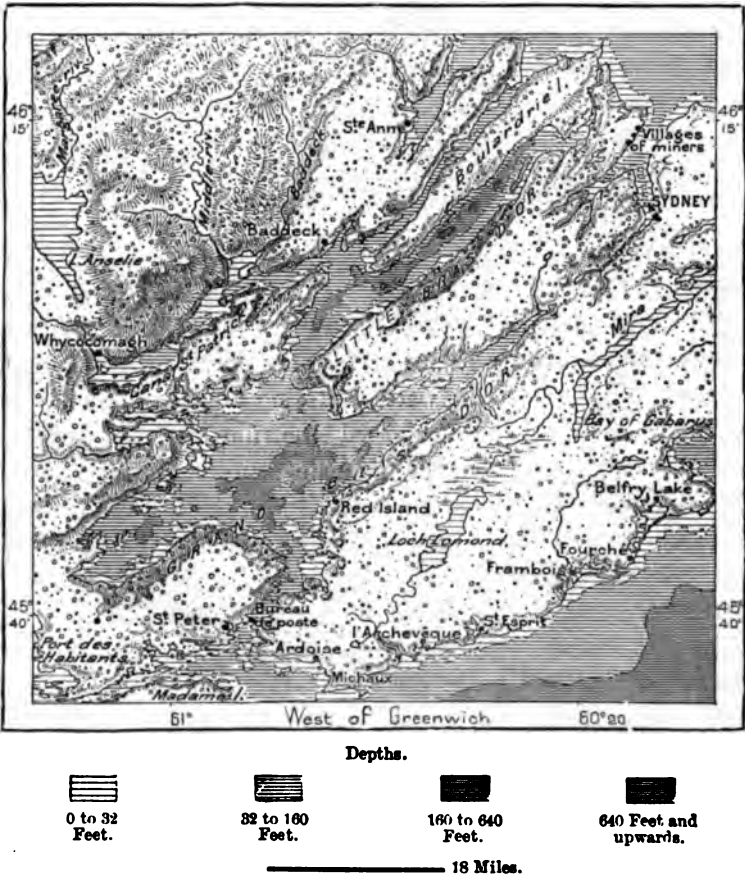
On the seaward side of Nova Scotia the beds of the various inlets are normally inclined in the direction of the marine bed, which in these waters shoals at the average rate of about 14 or 15 feet per mile.

The Bay of Fundy, whose Anglicised name is supposed to be a corruption either of "Fond de la Baie," or of "Baya Fonda" ("Deep Bay"), presents the most favourable conditions for the development of the phenomenon of the tidal bore, as observed in so many fluvial estuaries. Here, also, the systematic study of the surrounding coastlands has shown that the vast volume of water alternately rising and falling in the secondary inlets has had the effect of modifying the form of the seaboard and even that of the marine bed itself. South of Cape d'Or, which commands the entrance of the Mines (Minas) Channel, the sea, whose average depth in these waters is less than 25 fathoms, has been excavated to a depth of 45 or even

50 fathoms below the surface. Farther on the soundings have recorded depths of 58 or 60 fathoms. Not only does the swift current prevent the deposits of sands in these chasms, but it erodes the live rock itself; hence the coast is here everywhere formed of bare cliffs.

At the extremity of Chignecto Bay each of the secondary inlets, where the daily ebb and flow presents a difference of level of 40, 50, and even 65 feet, has been carved by these tremendous tidal currents out of the paleozoic rocks of

Fig. 153.—LAKE OF BRADOR.
Scale 1 : 1,300,000.



the isthmus connecting Nova Scotia and New Brunswick. The sea, in fact, is continually eating away this isthmus, so that the time may come when the Bay of Fundy will communicate directly with Northumberland Strait, thus transforming Nova Scotia to an island.

The little Amherst, Oulac, Tantramar, and Missiquash rivulets, which at ebb are almost lost amongst the sands, are changed at flood tide into vast estuaries three or four miles wide, while the low-lying shores of Minudie Island, with their vast beds of seaweed, are completely flooded at high water. The contrast between

the neighbouring seas is most striking. In the south the whole land seems to be periodically inundated with a deluge of rising waters, whereas the tidal currents seem to make no perceptible change in the form of the seaboard round Verte Bay in the Gulf of St. Lawrence, where the highest tides scarcely exceed nine feet.

CLIMATE OF THE MARITIME PROVINCES.

Although the Maritime Provinces lie under a somewhat more southern latitude, their climate on the whole resembles that of the St. Lawrence estuary. On the coastlands the summer heats are no doubt tempered by the Newfoundland fogs, and the severity of winter mitigated by the southern winds and the warm currents penetrating into the Bay of Fundy and its secondary inlets. But the effect of these modifying influences is almost confined to the seaboard, leaving the interior of the country subject to the normal conditions.

The contrast presented by the central plains and the maritime districts is represented by a discrepancy of as many as 30° F. between the extreme temperatures. Thus at Fredericton the summer heats are 8° or 10° higher and the winter colds 18° or 20° lower than at St. John.* Summer is followed by an autumn of early frosts and biting north winds, ushering in a winter which lasts more than half the year with alternating bright and snowy weather. So rapid is the transition from winter to summer that two or three days of mild spring weather are followed by the season of intense heats. At times forty-eight hours suffice to completely clothe a leafless tree with a fully-developed foliage. On the coastlands the average annual rainfall amounts to about 40 inches.

On the subject of the climate of New Brunswick, so important for intending emigrants to the Maritime Provinces, Mr. Ch. Lagrin, Secretary of the Local Board of Agriculture, has embodied much useful information in his memoir on the "Resources, Progress, and Advantages" of this province. "The climate of New Brunswick," he remarks, "is favourable to the successful prosecution of agriculture, and to the longevity of the inhabitants. It has been the custom to represent the climate of Canada as made up of extremes; but it must always be borne in mind that Canada is a country almost as large as Europe, and extending through nearly as many degrees of latitude; that it is subject to many influences affecting the climate, of which it presents every variety from the balmy, rainless summers and mild, wet winters of Southern British Columbia, to the almost unbroken winter of the Arctic zone.

"New Brunswick goes to neither extreme, for, although there may be exceptional

* Temperature of the Maritime Provinces:—

	North Latitude.	Mean Temperature.
Fredericton	45° 57'	42° F.
St. John	45° 17'	41°
Sydney	46° 8'	47°
Charlottetown	46° 14'	40°
Halifax	44° 39'	42°
Differences of summer and winter temperatures at Fredericton and St. John:—		
Fredericton	+96° to —36° F.	
St. John	+88° to —33°	

days every year when the thermometer registers above 90° Fahrenheit or below —20°, a man can do more days' work out of doors in the course of the year in the Province than he can in any part of the British Isles. During the coldest days children go to school, and men engage in their ordinary outdoor employment without inconvenience. A common working dress for out-of-door wear in the coldest weather consists of a suit of heavy knit underwear, a flannel shirt, trousers of homespun wool cloth, one or two pairs of woollen socks, a pair of boots, larri-gans or moccasins, a coat or 'jumper' of the same material as the trousers, a cloth cap with coverings for the ears, and a pair of woollen mittens.

"Clad thus a man can work out of doors all day long in the coldest winter weather ever felt in New Brunswick. If he is going on a long drive he will put on a heavy top-coat. Everybody who lives on a farm in New Brunswick is well provided with comfortable clothing, and the cold of winter, so far from being a drawback or an inconvenience, is both an advantage in many respects and a source of much enjoyment. New settlers in the country are invariably agreeably disappointed in the winter weather. The New Denmark settlers say that, on the whole, it is preferable to that of Denmark, and the Kincardine and other settlers from Great Britain say that, owing to the cheapness of excellent fuel, the dryness of the air, and the infrequency of serious storms, a New Brunswick winter is pleasanter than one in Great Britain.

"Summer in New Brunswick is usually very fine. In every season there are a few very hot days, but the greater part of summer is as delightful as the weather in any part of the world. The province is a favourite resort of thousands of persons from the Atlantic States, who seek a more enjoyable climate than they can find at home.

"The course of the seasons is somewhat as follows:—

"The year generally begins with the rivers and lakes frozen over firmly, and a foot of snow upon the ground; at least, this would be an ideal beginning for the year. The Christmas marketing will have made hard snow roads all over the country, on which a pair of horses will transport immense loads of produce. Lumbering operations are at this season under full sway.

"March is sometimes stormy, but its average temperature is higher than that of the two preceding months. Towards the close the snow begins to disappear from much-used roads and in sunny places.

"About the middle of April the ice in the rivers begins to break up, so that when May comes in navigation is open. In May vegetation begins to make rapid progress, and the growth appears wonderful to a person not familiar with the New Brunswick climate. A warm rain and a few days of bright sunshine completely transform the face of the country.

"In June planting is continued, and so rapidly do things mature, that crops may be put in late in this month and yet have an excellent chance of coming to perfection. In July haymaking begins, and towards the last of August early grain is harvested and early apples are ready for marketing. The harvest continues during September, which is generally the finest month in the year. In

October the root crop will be harvested, and early in November a fall of snow may be looked for, to be followed by a few days of most genial weather, known as the 'Indian summer.'

"December is the beginning of winter, the effect of which upon agriculture is, on the whole, not disadvantageous. The heavy frosts render the ground friable and open, doing more good than could be accomplished by several ploughings. To the pulverising action of the frost on the soil is attributed the remarkable yield of root crops in New Brunswick.

"Fever, ague and malarial fevers are unknown. There is an abundance of the best water everywhere; in fact, in all that is necessary to produce rugged man New Brunswick is unsurpassed. In all parts of North America the natives of this Province are admitted to be above the average in strength and endurance."

FLORA.

The Acadian flora is specially remarkable for the surprising proportion of its Arctic forms. In this respect it bears most resemblance to that of the Scandinavian peninsula, despite the vast extent of the intervening Atlantic waters. Till recently New Brunswick was an almost continuous forest, scarcely interrupted by the rivers, lakes and mossy tracts, which were formerly flooded depressions, but whose sphagnous growths have gradually absorbed the moisture, themselves expanding like huge sponges below the surface. Even within the last half-century some lakes of considerable size have thus disappeared beneath the encroaching bog-mosses.*

In 1825 a terrible conflagration, generally known as "the great Miramichi fire," destroyed nearly the whole of the forests in the northern and central regions of New Brunswick. The space laid waste covered 3,000,000 acres. Even in New England the sun was obscured by volumes of smoke, and at night the horizon was lit up by the reflection of the flames. Newcastle and the other villages on the coast were reduced to ashes, and to escape the fire the people had to plunge into the rivers or else take refuge with their domestic animals and the wild beasts on the reefs and sandbanks. After the devastation the evergreen pines were mostly replaced by trees with deciduous foliage, but here and there in the new woodlands are seen a few conifers still intermingled, after three-quarters of a century, with the charred trunks of the older plants.

Another great fire consumed the northern forests in the summer of the year 1870 when the country had suffered from a protracted drought. Formerly the Indians set fire to the woods in order to drive out the game, or else to repel the white settlers from the arable lands. The "gloomy days," to which reference is made in the early records of colonisation both in Canada and New England, probably owed their appalling darkness to an atmosphere charged with the smoke and ashes of some conflagration raging in the distance.

Fruit trees and berry-bearing plants of all kinds thrive well in the Maritime

* A. Leith Adams.

Provinces, and especially in Nova Scotia. The apples of this province are noted for their large size, brilliant colours, and fine flavour. In the western districts cherries are extensively cultivated, and grapes ripen in the open air in the more favoured localities. All varieties of small fruits, such as currants, gooseberries, raspberries, blackberries, quinces, and strawberries are easily cultivated; blueberries grow in abundance on the barrens; huckleberries, blackberries, raspberries in the woods; cranberries, hakeberries, snowberries, and bogberries in the marshy tracts.

In New Brunswick, also, apples and other fruits are profitably cultivated, the surplus stock being shipped, chiefly to the United States, and recently even to England. Immense quantities of strawberries are raised, but so great is the demand for them, both at home and abroad, that the supply is always short.

FAUNA.

Since the arrival of the whites the wild fauna has diminished throughout the Maritime Provinces. The moose and caribou (woodland reindeer) are still met, but in small numbers, although now protected by the game laws, which prohibit hunting during the close season. A few years ago the Virginian deer was seen only in a single district of New Brunswick, and it has now probably disappeared altogether. The kitchen-middens left in many places along the shore by the ancient Algonquin or Eskimo populations contain large quantities of the bones of this animal, generally split for the extraction of the marrow.

In 1873 the beaver was still found in certain districts 80 or 90 miles from the coast, but if he has himself disappeared, he has at least left many vestiges of his work in the fine meadow-lands occurring along the river-banks above his former dams. There are few watercourses in New Brunswick which do not present at intervals such rich grassy tracts, which yield the best hay in the country. According to the popular saying, "the work of the beaver is more lasting than that of the Indian."

The pekan or "fisher" (Pennant's marten) and other fur-bearing animals are also becoming more and more rare. Since the beginning of the present century, the walrus has ceased to frequent the Nova Scotia and New Brunswick waters, where it abounded during the eighteenth century. This marine animal has now withdrawn to the Arctic seas some 600 or 700 miles nearer to the pole. Seals formerly congregated in thousands in all the neighbouring inlets. In 1797, the southern channel having been completely frozen, their herds attempted to cross Prince Edward Island to the north side, and on this occasion hundreds were captured in the forests.* The year 1825 is also memorable in the zoological annals of the island. This was the so-called "mouse year," when these rodents swarmed in such prodigious quantities that, after devouring all the crops and grain, they marched down to the seashore, where they perished in countless multitudes, their bodies forming thick beds like masses of seaweed along the beach.

* John Stewart, *An Account of Prince Edward Island*.

Amongst the birds which formerly visited the Maritime Provinces, and which were met by the first European settlers, mention is made of the great auk, as well as a species of duck called the "Labrador duck." It is difficult to account for the disappearance of the latter, which was not an awkward bird like the penguin, but possessed great power of flight, so that it might easily have retired to more distant haunts without disappearing altogether.

Certain shellfish are now also vainly sought on the coasts which were observed by the naturalists of the last century, but their disappearance is explained by the pollution of the water by the quantities of sawdust covering the seashore round all the estuaries.* The reptiles and amphibia are represented in the Maritime Provinces by a few snakes, none of which are poisonous, by numerous turtles, frogs, and salamanders.

Amongst the loveliest denizens of the woodlands is the ruby-throat humming-bird, which arrives every year from the Caribbean Islands towards the end of May simultaneously with the appearance of the young foliage. It tarries longer than the swallow and other migratory birds of larger size, suddenly disappearing towards the end of September. It is surprising that the fledglings born during the brief summer season can acquire sufficient strength to wing their flight across the seas to their distant winter quarters in the West Indies. The humming-bird of the east coastlands of America differs little from the species which on the opposite side of the continent migrates periodically between Central America and British Columbia.

In the middle of the last century the fresh and marine waters of the Maritime Provinces teemed with animal life to a marvellous extent. Even still submarine banks are met where the fish are crowded together in compact masses. In 1837, during a fierce storm, a marshy lagoon communicating with the sea had its muddy bed completely covered with fish "heaped up like herrings in a barrel," and mixed with crabs, lobsters, mollusks, and annelids of all kinds. The rocks in the channel were covered with a seething mass of these decomposed animal remains, which in some places were deposited to a depth of several feet. For a distance of 5 or 6 miles the atmosphere was poisoned by the gases arising from this putrid matter, which yielded a superabundance of manure to the farmers of the surrounding district.

At present the salmon has ceased to ascend several of the watercourses in the Maritime Provinces, and in those which it still frequents nearly all that are captured bear traces of the injuries inflicted by the hook or by the meshes of the fishermen's nets. But the deep-sea fish which visit the coasts during the spawning season still abound in amazing quantities, and fishing still continues to be one of the staple industries of New Brunswick. Even in the harbour of St. John, crowded as it is with shipping, a species of cod is captured in large quantities. In good seasons as many as 20,000 barrels are exported, representing a total weight of over 1,750 tons.

* Hitchcock, *Scientific Survey of the State of Maine*.

INHABITANTS OF THE MARITIME PROVINCES.

The former inhabitants have left numerous traces of their presence, especially implements and weapons, both of chipped and polished stone. Their camping-grounds were concentrated especially on the banks of the Grand Lake, an affluent of the Lower St. John, and in the valley of the Tobique River. No objects belonging to a bronze age have been found, and the chert arrow-heads and hatchets were succeeded by the iron weapons stamped with the fleur-de-lis, which the French traders sold to the natives, and which are still picked up here and there in the woods.

Although the aborigines had no pottery, they were none the less already artists, judging, at least, from the rude sculptures now and then brought to light by the geologists and hunters. One of these carved on a rock on the banks of Lake Utopia, not far from Passamaquoddy Bay, is a boldly-chiselled medallion, such as none of the present natives could attempt to imitate.

The practice of giving the local Indians the name of "brother" has passed from the French trappers to the present white populations, although in their mouth the term sounds somewhat like irony. The whites have allowed their "brothers" to perish, if they have not directly hastened their extinction. According to the French missionaries the aborigines of Acadia, including the islands and peninsulas, probably numbered 10,000 towards the beginning of the seventeenth century, but the census of 1881 returned only about 3,400 altogether, of whom over 1,600 resided in Nova Scotia.

THE MIC-MACS AND OTHER ABORIGINES.

This remnant of the old owners of the land belong to three different Algonquin tribes: the Mic-Macs, or Souriquois, scattered over Nova Scotia and the northern parts of New Brunswick; the Etchemins, or Eteminquois, who dwelt more to the south in the basin of the St. John River, and who ranged at one time as far as the banks of the St. Lawrence opposite the Quebec headland; lastly, the Melicites (Milicites), who now occupy a few reserves on the south frontier of New Brunswick, but who are more numerous in the contiguous state of Maine. Their Protestant neighbours, the New England Puritans, call them "Amalekites," in allusion to the accursed race whom the children of Israel were called upon to exterminate.

The original language of the Mic-Macs, which they still speak, is said to contain a certain number of words resembling synonymous roots in the European languages, a phenomenon regarded by certain writers as an indication of a long sojourn of the Scandinavians in the country.* Both the Mic-Macs and Etchemins have also borrowed a number of expressions from the early French settlers, with whom they always lived on a friendly footing.

These Algonquins are no longer full-blood Indians, all their groups having

* Dawson, *Acadian Geology*; Ch. G. Leland, *Algonquin Legends of New England*.

been crossed with the French, Scotch, and English settlers established in the country for over three hundred years. Nevertheless it is impossible to confound any of them with their European neighbours. Their racial characters have been but slightly modified, and all are still distinguished by their thickset figures, large nose, thick lips, large mouth, prominent cheekbones, small eyes, smooth or lank black hair. Leith Adams considers that they resemble the Eskimo more closely than they do the ordinary Red-skins. The majority age prematurely, and more than half of the children perish a few days after birth, or during the teething period. Consumption, which is very prevalent amongst the white inhabitants of the Maritime Provinces, commits great havoc amongst the natives.

Very few of these Indians cultivate the plots round about their cabins; most of them still prefer fishing and hunting, occupying their spare time in building canoes, in basket-work, or embroidering mocassins. According to the early missionaries their ancestors had no cult, and practised no religious ceremonies of any kind; at present they pass for Roman Catholics.

THE EUROPEAN SETTLERS—THE ACADIANS.

It was on an island in the St. Croix estuary, within the Etchemin territory, that the first French settlement was founded by de Monts. But half of the colonists having been carried off by the terrible "land sickness," this fatal spot had to be abandoned for Port Royal, a more favourably situated station on the east side of the Bay of Fundy. From this point the colonisation, frequently interrupted by wars, spread slowly along the neighbouring coastlands.

At the beginning of the eighteenth century, a hundred years after the foundation of Port Royal, the whole of the white population in French Acadia, that is, in the maritime region south of the St. Lawrence basin, numbered not more than 1,300 or 1,400; in 1713 they had increased to 2,100, the great majority from Normandy and Perche.* This vigorous population of peasantry and fishers continued to grow by the natural excess of births over deaths, and towards the middle of the eighteenth century their numbers had been multiplied sixfold.

In virtue of the treaty of Utrecht Acadia was ceded to Great Britain; but the French colonists having been recognised as "neutrals," the oath of allegiance required by the British Government guaranteed to them the privilege of never being called upon to take up arms either against their former fellow-citizens, or against their "brothers," the Indians. According as they increased in numbers, or enlarged the area of their cultivated lands, they seemed, if not dangerous, at least inconvenient neighbours for the British settlers. Troubles arose on the borders, followed by complaints and charges of high treason,† and increasingly

* Benjamin Sulte, *Histoire des Canadiens français*

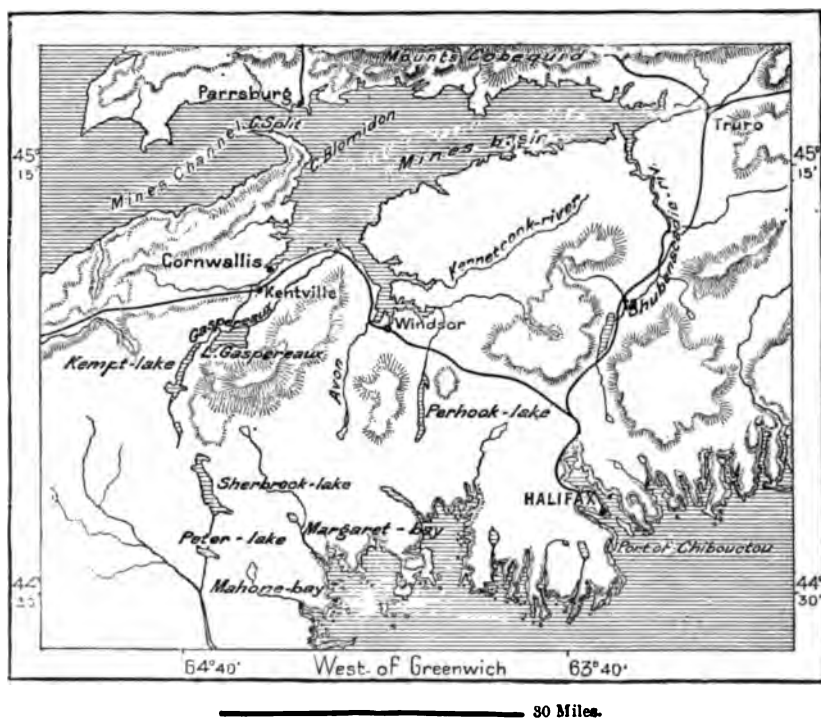
† The general charge was that they had forfeited their neutrality, and as British subjects had been guilty of treason by furnishing the French and hostile Indians with information, besides supplying them with provisions and places of refuge. The chief specific charge was that as many as three hundred of these Acadians had been actually found in arms assisting the Canadians at Fort Beau-Séjour when

exacting demands for the expulsion of the French settlers and the confiscation of their lands.

At last, measures of spoliation were decided upon, without awaiting instructions from the British Government, which was opposed to such proceedings, and which, on the contrary, advised that "the Acadians should be left in the peaceful possession of their villages and fields."* In 1755, Lawrence, Governor of Nova Scotia, invited all the French settlers, young and old, to assemble in the churches, where a royal

Fig. 154.—MINES BASIN AND LAND OF THE ACADIANS.

Scale 1 : 2,500,000.



decree would be communicated to them. Most of the inhabitants presented themselves unarmed, and without suspicion, at the indicated places, where they learnt to their amazement that "their lands, their houses, their cattle, their flocks, were confiscated by the Crown," that they themselves were condemned to transportation, but that the king "in his great goodness," hoped "always to find them loyal subjects in whatever part of the world their lot might be cast."

The Acadians, already prisoners of the king, vainly attempted to escape; vessels presently arrived from Boston, and the unhappy colonists were driven in

that place was captured by the English. But whether these charges were well founded or not there can be no doubt that the ill-fated Acadians were treated with unnecessary harshness and cruelty. Many were certainly innocent, and some, such as René Leblanc, the Notary Public mentioned in Longfellow's *Evangeline*, had even proved their loyalty to the British Government at the risk of their own lives and liberties; yet all alike were involved in the general ruin.—ED.

* Rameau de Saint-Père, *Une Colonie Féodale en Amérique*; Casgrain, *Un Pèlerinage au pays d'Évangéline*.

batches to the landing-stages. Despite the solemn promises of the governor, several families were broken up; the "grand dérangement," as the Acadians called this enforced exodus, was accompanied by outrage and murder, and at the very moment of embarking, the exiles beheld the terrible spectacle of the raging fires devouring their houses and farmsteads.

According to the official registers sent to the Government, the exiles numbered altogether about 6,300; but Haliburton's estimate is nearly 8,000, without reckoning the hundreds said to have been killed, or to have died of cold and exhaustion in the forests, swamps, and marine inlets. More than half of the Acadian population, estimated at 14,000, and by Rameau at 16,000, disappeared during the terrible year; the survivors, thanks to the friendship of the Indians, found a precarious refuge in the more inaccessible districts of the interior.

The great majority were distributed almost indiscriminately amongst the different English colonies of the Atlantic seaboard, but they were received with sympathy in Maryland alone, whose inhabitants professed the same faith. Famine and smallpox carried off hundreds, and the stations along the routes were marked by the remains of the dead. In many places they were refused work on the farms, or else they were offered employment on the condition of being re-baptized as Protestants, or surrendering their children to the shepherds.* A large number were transported a second time, some to the West Indies, others as far as British Guiana. As many as 1,500 were brought to England, where they were allowed to perish in the worst slums of Liverpool, Bristol, or Southampton. The survivors were at last restored to the mother country, many being removed to Poitou, Berry, and especially Belle-Ile-en-Mer, where some of their descendants are still found.

A few families were also fortunate enough to reach France direct from Acadia. But the largest group, destined later to constitute a separate colony, found their way to Louisiana, drifting in a flotilla of boats down the current of the Ohio and Mississippi. They numbered about 500, and in their new homes they gradually increased, thanks to the arrival of fresh refugees coming from St. Domingo and other West Indian islands. Even now, a certain number of these "Canadian" families still keep aloof from the bulk of the Louisiana "Creoles" of French origin. Various "Cadies," or Acadian communities, were also founded near Quebec and in other Canadian villages. Lastly, a number of the Acadian seafarers, having no other resource, took to piracy, infesting the British settlements on the Atlantic seaboard, capturing vessels and plundering unprotected settlements.

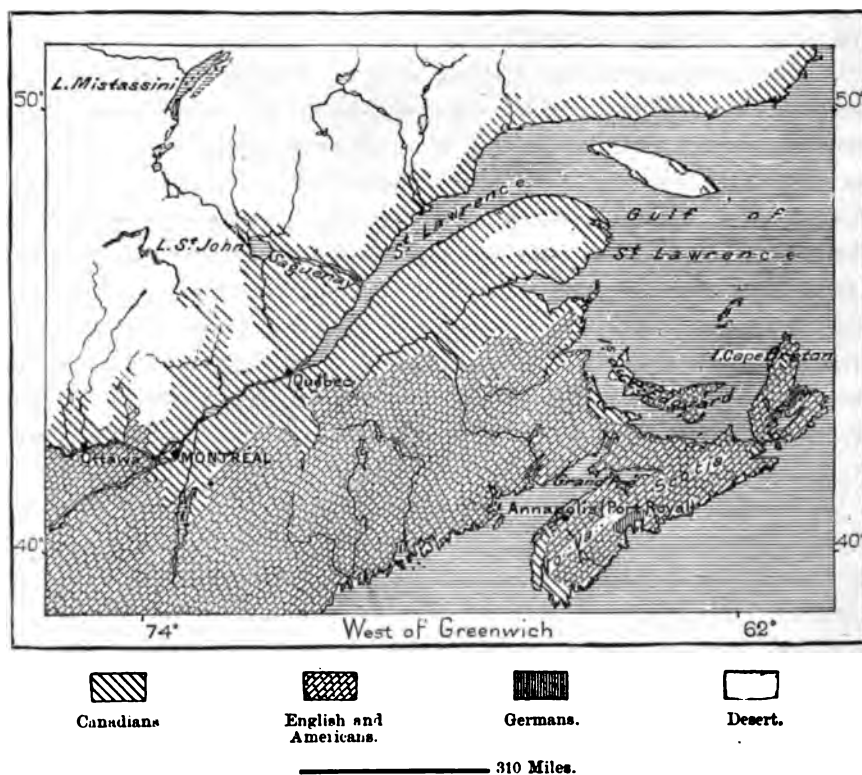
In 1759, after the fall of Quebec and the submission of the Canadians to English rule, the Nova Scotian authorities, being now at peace with France, and having no longer any pretext for preventing the return of the Acadians, allowed the exiles to come back in hundreds. In some instances the members of scattered

* It should, however, be stated, in justice to the New Englanders, that many of the exiles "became a burden to the public, owing, in a great degree, to the invincible repugnance which they felt in accepting the usual charitable, though humiliating, establishment of paupers for their children." —(Minot.)

families again became united after years of separation ; but they sought in vain to resume possession of the lands they had brought under cultivation ; their farms had all passed into the hands of others. They were obliged to wander from place to place, and settle on new lands, without, however, being able to obtain regular titles. Scarcely had they cleared the ground when it was granted to English or Scotch colonists, and the Acadians were thus driven again into exile, or else to take service as hirelings on the lands of strangers. Their social position remained unsettled, their very existence scarcely tolerated till after the American War of

Fig. 155. — INHABITANTS OF EAST CANADA.

Scale 1 : 18,000,000.



Independence, when British supremacy in Canada seemed to be seriously endangered. Even then the Acadians were refused the right of establishing compact colonies ; each of their settlements had to be isolated between two Protestant estates, and none of the returned exiles were permitted to settle on the sea-coast. At last, by the abolition of the oath of allegiance, in 1827, they were entirely assimilated to the other citizens, and declared eligible for public functions.

But notwithstanding several generations of oppression, the French Acadians, who seemed more than once on the point of being exterminated, had never ceased to multiply. During the hundred years, from 1785 to 1885, the Acadian population doubled itself once every twenty-seven years, and in 1881 the Maritime

Provinces contained altogether a French population of 108,605 ; at present they must number about 130,000, or one-seventh of all the inhabitants. All immigrants, however, are of English, German, or Scandinavian speech, and there is also a considerable movement of emigration towards the United States. But nearly all the English-speaking emigrants from the Maritime Provinces settle permanently abroad, whereas the Acadians, who seek employment in the quarries, brickfields, and fisheries of New England, generally return every season to Canadian territory.

Thus it happens that the annual progress of the Acadians is more rapid than that of the other ethnical elements of the country. Should the present birth-rate be maintained in the French families, they will eventually constitute the majority in several districts, and resume the political and social influence of which they were violently deprived about the middle of the last century.

Nearly everywhere the Acadians reside in separate enclaves, isolated from the rest of the population. Thus, in Prince Edward Island, they are concentrated chiefly in the north-west extremity of the land ; in Nova Scotia they occupy the south-western districts on the shores of the Atlantic and the Bay of Fundy ; their villages also skirt both sides of the Canso Channel, and Madame Island at its southern entrance is in their exclusive possession. In New Brunswick, where they are relatively still more numerous, they constitute one-fifth of the entire population. Here their colonies are dotted round the shores of the Bay of Chaleur and of Miramichi Bay, and farther south on the coast of Northumberland Strait. Lastly, they inhabit all the north-western part of the country bordering on the province of Quebec. The territory of Madawaska, that is to say, both the Canadian and American sides of the upper St John valley, already belongs to the Acadians, descendants of those who took refuge in the unknown forests of the interior during the terrible days of the enforced exodus.

The northern frontier of New Brunswick is the only part of the Maritime Provinces where the Acadians come in contact with their Canadian kinsmen. But, strange to say, although both are equally of French origin and members of the Roman Catholic Church, the two sections do not regard themselves as altogether forming a single nationality. Having dwelt apart, separated by vast distances and subjected to different historical vicissitudes, they have developed other traditions and other usages. Their patron saints are different, as are also their national feasts. The Canadians, being more wealthy and more highly cultured, readily fancy themselves sprung of a nobler stock, while the Acadians, on their part, reproach their Quebec fellow-countrymen with having sacrificed the interests of the weak to those of the strong in the council-chambers of the Dominion. Nevertheless, both branches have already met together in friendly congress on various occasions.

THE ENGLISH-SPEAKING SETTLERS.

In the Maritime Provinces, the English, Scotch, and Irish settlers, whether natives of the British Isles or born in the country, are represented in nearly equal proportions, the first two numbering about 220,000 each, the third some-

what less than 200,000. In New Brunswick the ethnical preponderance belongs to the Irish, while the term Nova Scotia is justified by the numerical ascendancy of the Scotch in that region. The Scotch are also in a majority in Prince Edward Island. Nevertheless the gradual fusion of all these British communities naturally redounds to the advantage of those who have given their language and institutions to the country. Kelts or Anglo-Saxons, all call themselves English; even the Germans, descendants of settlers introduced during the last century, and, for the most part, domiciled on the Atlantic shores of Nova Scotia south-west of Halifax, have already been Anglicised. Amongst them, however, were included a large number of Dutch and even of French-speaking Swiss, and French names are by no means rare amongst families originally classed as Germans. On the other hand there still exists a certain proportion of Scotch Highlanders, who speak the Gaelic language at least in the family circle. Thus, in the New World, there survive separate communities of this language, which has already been reduced to such narrow limits in the Old World. These Gaelic-speaking groups are found chiefly in the interior of Cape Breton and in the central and hilly parts of Nova Scotia. Everywhere they live on excellent terms with their Acadian neighbours, also jealous guardians of their national speech. To these linguistic enclaves must also be added a few groups of Icelanders, who have in recent years settled in Nova Scotia with varying success.

Hitherto immigration has been slight, so that the growth of the population in the Maritime Provinces is due almost entirely to the excess of births over the mortality. But this excess is itself slight, and, in several districts, scarcely causes any perceptible increase, a phenomenon which may perhaps be connected with the prevalence of certain grave maladies. Thus leprosy makes terrible ravages amongst the New Brunswick Acadians, great eaters of fish, who, for several generations, have in no respect modified their habits, migrating little and neglecting to renovate their blood by alliances with strangers. Amongst the English and Scotch inhabitants of Halifax, also, mental disorders are very prevalent, most families at least having one of its members affected by some form of insanity. Phthisis, pneumonia and diphtheria make great ravages in the eastern provinces of the Dominion, and in Nova Scotia nearly one-fourth of the whole mortality is attributed to consumption; the proportion per thousand rises from 138 in the province of Quebec to 226 in New Brunswick, and 241 in Nova Scotia. In the citadel of Halifax three out of every ten deaths in the English garrison are referred to some form of chest disease.

The blacks, descendants of runaway or emancipated slaves removed by the British Government to Nova Scotia, also suffer much from the same class of diseases. Nevertheless, these Africans, notwithstanding the asperity of this northern climate with its keen winds, fogs, and storms, have become acclimatised. During the ten years from 1871 to 1881 their numbers were increased in the normal way from a little over 6,200 to more than 7,000. The rapid increase of families and the numerous cases of longevity sufficiently attest the general salubrity of the climate.

With regard to longevity, of which subject Mr. E. B. Biggar has made a special study, it would appear that an unusually large proportion of the inhabitant of the Maritime Provinces are found to be octogenarians, while nonagenarians and even centenarians are relatively numerous. In a total population of about 870,000 the census of 1881 returned nearly 7,000 as over eighty years of age—3,853 in Nova Scotia, 3,227 in New Brunswick, and 883 in Cape Breton; according to the same census there were 44 then living over a hundred years old, that is 24, 12 and 8 in the three provinces respectively. A list is given of 26 inhabitants of Nova Scotia whose ages are stated to range from 100 to 117. Many of these are still living, but the figures do not appear to be in all cases absolutely trustworthy. A corresponding list for New Brunswick contains the names of 22 centenarians, some of whom are said to be 108, 109, and even 110 years old. But without attaching too much importance to these statements, it may be safely concluded that both the British and French races thrive well in the Maritime Provinces, where they are now thoroughly acclimatised and nowhere betray any physical deterioration in their transatlantic homes. They are in every respect as robust, as vigorous and long-lived as the parent stocks, and the Acadians seem on the whole to be even a stronger and more healthy people than their French progenitors.

TOPOGRAPHY OF NEW BRUNSWICK.

On the south side of the Bay of Chaleur New Brunswick possesses no centres of population beyond a few fishing-ports, such as *Dalhousie*, *Bathurst*, and *Caraquet*. Fisheries and oyster-beds are found in the waters of *Shippegan*, a triangular island separated from the mainland by a winding channel which forms an excellent harbour, or rather a group of harbours, and which has been proposed as a port of call for the transatlantic liners. In the neighbourhood of Shippegan, on an inlet or lagoon separated from the sea by a sandy spit, stands the little Acadian village of *Tracadie*, well known for its lazaretto or leper establishment. The malady is said by some to have been introduced by some mariners from the Levant in the eighteenth century, but others attribute it to consanguineous marriages, which are very numerous both in this district and on other parts of the coast. The scourge may also perhaps be partly due, as in Norway, to a diet composed too exclusively of fish. However, it appears to be gradually disappearing. In 1889, the hospital contained only twenty-three patients suffering from leprosy, and of these four came from Cape Breton.*

Miramichi Bay, which lies farther south on the east coast of New Brunswick, has often proved false to its name, which is explained to mean "happy retreat." The French colonies here founded in the seventeenth century were successively destroyed by the English, and on many occasions the settlers seeking refuge in the woods perished of hunger. In the year 1760 the district was completely wasted, not a single white cabin escaping. In 1775 a few Scotch colonists arrived; but

* *Montreal Star*, September 12, 1889.

they were in their turn attacked and plundered by the "Bostonians." At last, the peaceful colonisation of the country was begun after the war of American Independence, when a party of loyalists, emigrating from the United States, settled on the banks of the Miramichi, and developed a timber trade with England.

Chatham, standing at the head of the Miramichi estuary, is one of the busiest sea-ports along the east coast; its deep-sea shipping amounted, in 1887, to over 112,000 tons.

Richibucto Bay, a little farther south on the same coast, lies opposite the western extremity of Prince Edward Island, forming a considerable centre for the export of timber and for shipbuilding. It is now chiefly frequented as a watering-place. Still farther south are scattered the Acadian villages of *Buctouche*, *les Cocagnes*, *Bourgeois*, *Grandigue*, *Shediac* or *Gédaïque*, *Pointe-du-Chêne*, and *Barachois*. The chief station for the local communications with Prince Edward Island is at *Pointe-du-Chêne*, but it is expected that before long the passage between the island and the mainland will be shifted farther east to the narrows of Northumberland Strait. At this point two headlands project towards each other, leaving an intervening channel of not more than nine or ten miles. In winter, this channel is frozen or blocked by ice, which the steamers armed with spurs often find it difficult to break through. It is accordingly proposed to construct a tunnel under Northumberland Strait somewhere between the two headlands. When the dominion was created by the union of the various provinces, mutual engagements were made to develop the communications between the several confederate states, and the promoters of this scheme build their hopes of success on such pledges. As Vancouver insists on the extension of the Pacific Railway across the Juan de Fuca Strait to its capital, so the Prince Edward Islanders want their ten-mile tunnel to connect them with the rest of the confederacy.

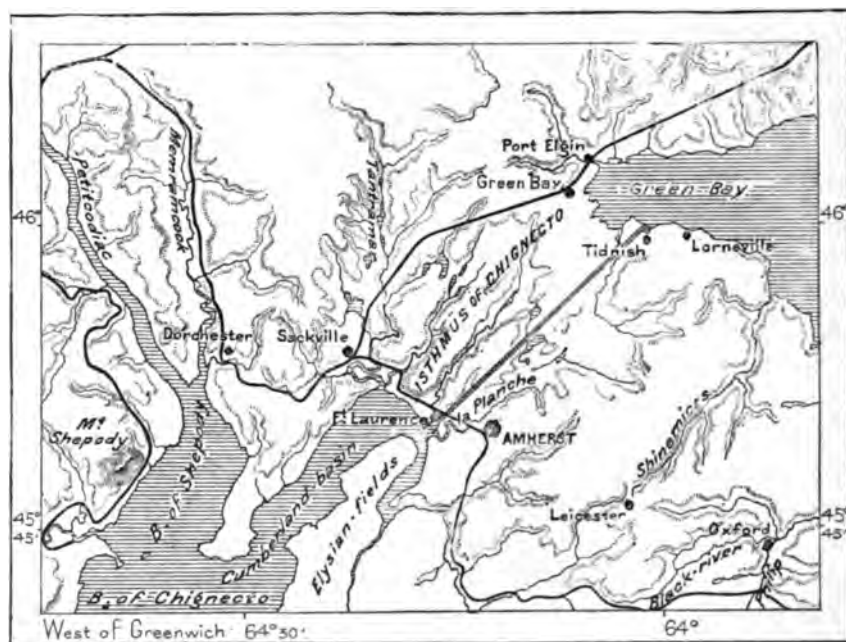
To this stupendous undertaking, far superior to that of the Severn Tunnel lately completed in England, corresponds another daring project in the same region, that is, the construction of a navigable canal across the isthmus connecting New Brunswick with Nova Scotia. The tremendous tides of Chignecto Bay—northern extremity of the Bay of Fundy—penetrate into this isthmus to within 16 miles of Verte Bay, a lateral inlet on Northumberland Strait; but to pass from one harbour to the other vessels have to traverse a distance of about 880 miles, all the way round Nova Scotia and Cape Breton, across seas whose navigation is endangered by strong tidal currents, dense fogs, reefs, and sand-banks. Hence the cutting of a ship canal between the two inlets naturally suggested itself all the more that the moderately elevated isthmus itself might be pierced without any great engineering works. But the difference presented on both sides by the action of the tidal waves might create special difficulties which the engineers themselves are not confident of being able to overcome. Hence it has been proposed to replace the canal by a ship railway.

The works were actually begun in 1883 at Fort Lawrence on the Bay of Fundy side, where the contractors have already completed the channel giving access to the isthmus, besides constructing the protecting embankments and preparing the foun-

dations of the elevator. This apparatus is calculated to raise a weight of 2,000 tons, although it is not contemplated to transport vessels of more than 1,000 tons burden from bay to bay. Such a project was originally proposed by Mr. Eads for the Isthmus of Tehuantepec, between the Gulf of Mexico and the Pacific Ocean. Should it be successfully carried out at the Isthmus of Chignecto, it will certainly mark a new departure in the development of local and international communications. On its success or failure are already dependent several analogous schemes for other isthmuses, the excavation of which has resisted all the skill and resources of modern mechanical science. History itself offers nume-

Fig. 156.—ISTHMUS OF CHIGNECTO.

Scale 1 : 700,000.



rous examples of similar enterprises which have been brought to a triumphant issue. Thus vessels of over 200 tons burden were carried across the Isthmus of Corinth by the *dioclos* of the Athenians, while the far more daring Venetian engineer, Sorbolo, transported a whole fleet, comprising vessels of 300 tons, from the Adige over a hilly isthmus down to Lake Garda.*

Owing to the high tides the rivers flowing into Chignecto Bay are alternately broad estuaries and alluvial tracts traversed by meandering rivulets. The Tan-tramar, in French-Acadian Tintamare, is so named from the bore which ascends it far inland, and which appears to have formerly penetrated even much farther into the interior; hence the extensive meadow-lands, which form an inland pro-

* Ketchum, *Chignecto Marine Transport Railway*.

longation of the estuary and surrounding swamps. A still larger estuary is that of the Petitcodiac, where the tides are said to rise 65 or 66 feet over 30 miles from its mouth.

According to some authorities the tides of the Petitcodiac estuary are by far the highest on the surface of the globe, rising not merely to 50 or 60, but even to 120 feet. They are also said to be accompanied by a tremendous bore, which may be seen rushing with a terrific roar some 30 miles up the estuary. For the purpose of witnessing this extraordinary phenomenon, or verifying its existence, Mr. Stuart Cumberland lately visited the district, and was greatly disappointed at the result. "The tide duly came," he writes, "with its much vaunted bore, but I confess to having been badly treated and altogether swindled by it; for, instead of having a rise of half the talked-of 120 feet, its height scarcely exceeded six feet."* Anyhow the Petitcodiac, or at least its estuary, is navigable for 25 miles by vessels of the largest size, while ships of from 60 to 100 tons can ascend it as far as Moncton.

The town of *Moncton*, situated at the north-eastern extremity of the Petitcodiac estuary, has become the capital of the isthmus; it is the converging-point of several railways, and here are manufactured large numbers of locomotives, carriages, and other rolling stock. The first inhabitants of this busy industrial and commercial centre were Pennsylvanian Germans who had remained loyal to England, and were removed here after the War of Independence. The neighbouring coal-mines have already been exhausted; but the stone-quarries are worked to supply building materials for Boston and New York. The marshy and saline coastlands supply vast quantities of fodder for the cattle exported in great numbers to England. Sportsmen are also attracted to the neighbourhood by the enormous flocks of aquatic birds frequenting the surrounding swamps and quagmires.

East and south-east of Moncton the land has been occupied by Acadian settlers. Around the village of *Memramcook*, which may be regarded as the metropolis of French Acadia, some of the colonists exiled in 1755 recovered their farms and were allowed to resume possession of their ancestral lands. The tracts flooded by the destruction of the dykes have been again embanked and reclaimed for cultivation. In the district are still seen the ruins of the forts which were the scene of many a struggle between the French and English during the border warfare. The College of Memramcook is one of the most famous Catholic establishments in North America.

St. John, the most important Canadian port in the Bay of Fundy, takes its name from the great river of New Brunswick. In its upper course the river traverses a territory inhabited by French populations. The villages of *St. Basil* and *Edmunston* are inhabited by the descendants of the Acadians expelled from Nova Scotia, and, thanks to the railway, they now find themselves reunited with their Canadian kindred of the St. Lawrence basin, from whom they were formerly separated by the intervening forests.

The town which has sprung up in the vicinity of the *Grand Falls*, and which

* *The Queen's Highway*, p. 400.

is so named, is also partly inhabited by Acadians, with whom are now associated some immigrants from Scandinavia. Lower down the other towns along the banks

Fig. 157.—NEW BRUNSWICK SCENERY—VIEW TAKEN NEAR ST. JOHN.



of the St. John were founded by French settlers, who, during the last century, had to give place to the "Bostonian" conquerors, and later to the American

it carried on a large export trade in timber with England and the West Indies ; but in consequence of certain custom-house regulations the seat of this industry was shifted, and St. Andrews fell into a state of decay, while farther north the

Fig. 159.—PASSAMAQUODDY BAY.
Scale 1 : 1,000,000.



Canadian town of *St. Stephen*, on the *St. Clair River*, rapidly increased in trade and population.
Nevertheless *St. Andrews* still enjoys the advantage it derives from the

picturesque Passamaquoddy Bay, with its numerous isles and islets and encircling headlands of pink granite. At the entrance lies the dangerous group of reefs known as the "Wolves." Another island, disposed like a breakwater over against the American harbour of Eastport, has received the name of Campobello. Farther seawards rises the large island of Grand Manan, which is encircled by red cliffs and clothed with timber. Both Grand Manan and Campobello are visited in summer by thousands of strangers, mostly from Boston and other Massachusetts towns, some invalids, others pleasure-seekers.

TOPOGRAPHY OF NOVA SCOTIA.

On the opposite side of the Bay of Fundy the shores of Nova Scotia, which belonged to the same Acadia as New Brunswick, were like it frequently ravaged by war, the Bostonian Puritans being unable to tolerate the presence of French and Indian Roman Catholics in their neighbourhood. The town of *Amherst*, situated on the Chignecto isthmus, stands on a site which was long contested by the rival French and British settlers. The ruins of forts are still shown in the surrounding woods and prairies, while the sanguinary conflicts that here took place are commemorated in such local names as that of *Bloody Bridge* still borne by a bridge crossing a neighbouring creek. At present, thanks to its rich meadow-lands, the district is one of the most flourishing in Nova Scotia. All the lowlying coastlands are protected by levees or embankments against the strong tidal currents; as in Holland the flocks and herds may be seen grazing behind these dykes many feet below the surface of the sea.

Analogous to the position of Amherst is that of *Truro* at the extremity of the large branch of the Bay of Fundy known as the Cobequid Bay. It is now occupied by people of English speech although, like Amherst, standing on the site of an old French station. In this region not a single Acadian survives, no descendants of the exiled race having returned, as they have in other districts. The plains where they were most numerous, that is, round the southern shores of the Mines Basin, have also lost the original French settlers, who had transformed the whole country to a smiling garden.

Eastwards the river Avon, formerly called the Pisiqid, or "Meeting of the Waters," from the large number of creeks converging in its valley, forms the frontier of this rich land of gardens, orchards, and meadows. The district is watered by the Gaspereaux, the Rivière aux Canards, the Rivière aux Habitants, and other streams which have for the most part preserved their French names.

A peninsula, formerly submerged at high water, but now protected by stout embankments, which had been begun by the Acadian settlers, projects seawards between the marine channels. This is the famous *Grand-Pré*, the grassy plain which formerly gave its name to the whole district. Now it is much better known as the "Land of Evangeline," for there is scarcely a poem more universally popular in New England and in other English-speaking countries than that in

which Longfellow relates the painful Odyssey of the Acadian exiles.* Towards the end of the eighteenth century, when some of the survivors returned to their homes thirty or forty years after the "grand dérangement," they found their holdings occupied by a new generation of settlers from Massachusetts, Rhode Island, England, and Scotland.† They had consequently to wander farther afield in search of other still unoccupied lands.

Grand-Pré itself has not been chosen as the site of any towns or villages, as if the present possessors feared the district was haunted; but the lowlying tracts are fringed with a dense population. In this district the chief town is *Windsor*, which stands on one of the branches of the Avon estuary, and which possesses the most famous public school in Nova Scotia. Large quantities of gypsum are shipped for the United States at all the landing-stages of the Mines Basin; but the coal-pits and gold-washings from which this branch of the Bay of Fundy takes its name have long ceased to be worked. *Parrsborough*, a busy little trading-place, commands the northern entrance of the Mines Basin.

From Windsor and *Kentville*, the two largest centres of urban population in the land of Evangeline, a railway leads to *Annapolis Royal*, the *Port Royal* of the French. Goat Island, which lies in the narrow marine channel at Annapolis Gut, the old "Rivière Dauphin," was the site occupied by the first establishment founded by de Monts in the year 1604. In the vicinity stand the modern town and seaport of *Digby*.

The citadel of *Annapolis*, which often changed hands during the Anglo-French wars, is still standing, and has been reserved as Crown property, although no English garrison has been stationed here. The Acadians of the surrounding district had also to forsake their villages and farmsteads; but thousands of the refugees found a retreat along the shores of the lakes and rivers in the south-west corner of Nova Scotia. Here they joined the Mic-Mac Indians, adopting their language and forming with them an independent little theocratic state, which was long administered by a Roman Catholic priest. Their descendants, now subject to the Anglo-Canadian laws and living almost exclusively on fishing and agriculture, take scarcely any part in the general industrial activity of their neighbours of British origin. The apples raised in this district are said to be the best in

* In reading this account of the "painful Odyssey," however, the student of history should be warned that the poet has obscured the true facts of the expulsion "beneath a glamour of romance and pathos." It must always be remembered that the policy at that time adopted was rendered absolutely necessary by political considerations. Quebec had not yet fallen, and there seemed reason to believe that the Acadians, though British subjects, were directly or indirectly aiding their Canadian fellow-countrymen in prolonging the struggle for supremacy on the North American continent. When that struggle was decided in favour of the Anglo-Saxon race by the capture of Quebec, the Acadians were permitted to return, and many did actually resume possession of their ancestral homes, though under altered social and political conditions.—ED.

† So the poet:—

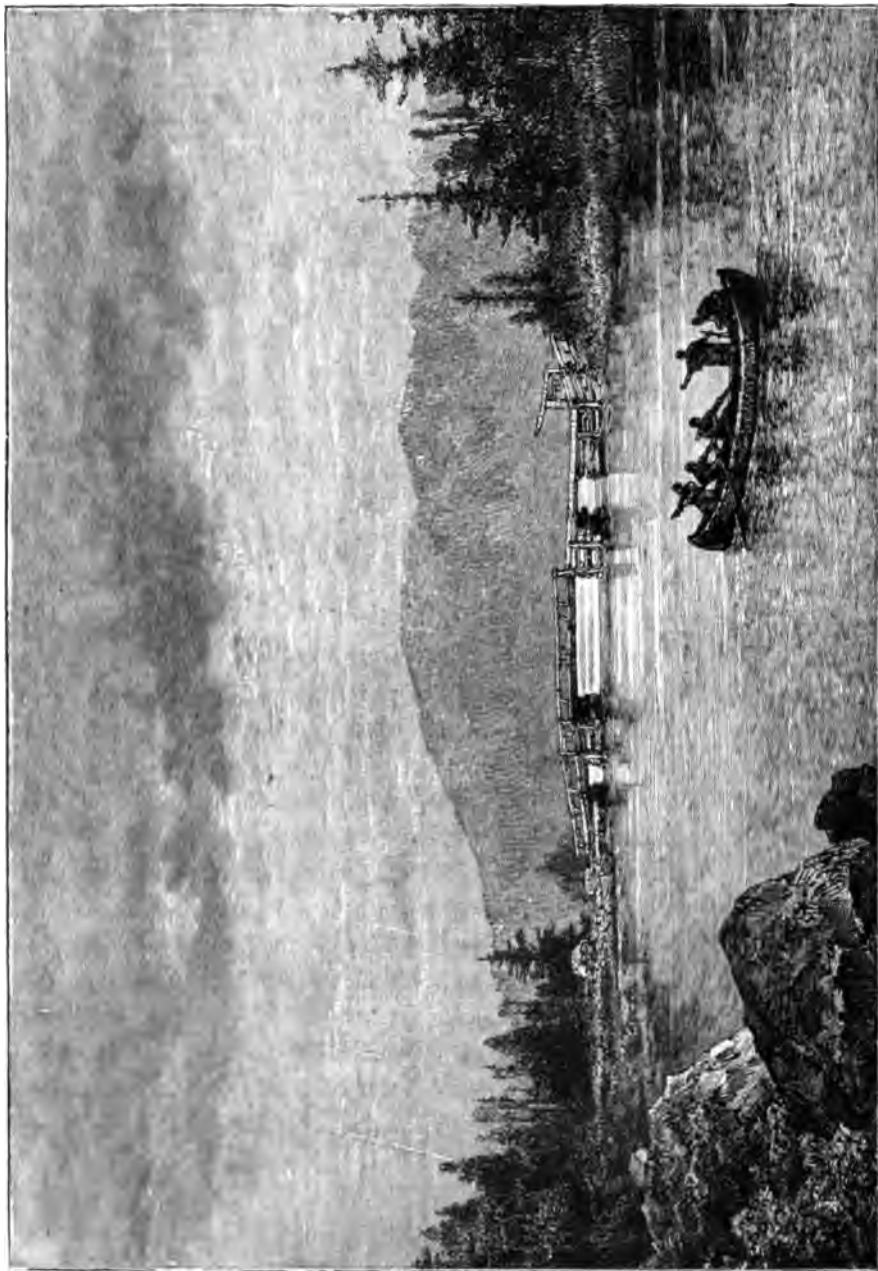
"Still stands the forest primeval, but under the shade of its branches
Dwells another race, with other customs and language,
Only along the shore of the mournful and misty Atlantic
Linger a few Acadian peasants, whose fathers from exile
Wandered back to their native land to die in its bosom."

(*Evangeline, ad finem.*)

the New World, and whole cargoes of them are shipped for New York and New England.

Yarmouth, southern metropolis of Nova Scotia, lies on a narrow creek some

Fig. 160.—SHIP-HARBOUR, NORTH OF HALIFAX, NOVA SCOTIA.



three miles from the open sea. Of all Canadian towns it most resembles those of Massachusetts, having, in fact, been founded towards the middle of the last century by some seafarers from New England, whose numbers were increased by some

American loyalists after the War of Independence. Yarmouth is occupied mainly with fishing and shipping, this port owning over 300 vessels of more than 100,000 tons burden. It enjoys the advantages of direct steam communication with Boston, Halifax, and the other seaports round the neighbouring coasts.

But while Yarmouth flourishes, *Shelburne*, which lies on the other side of Cape Sable, and which was founded under analogous conditions, has lost much of its former importance, despite its magnificent group of harbours. The colony of loyalists which was here founded in the year 1783 constructed two vast establishments, which attracted a numerous seafaring and artisan population; the object appears to have been to make Shelburne the capital of all the maritime provinces that had remained faithful to England, and as many as 12,000 persons were soon concentrated at this point of Nova Scotia. But the surrounding regions, studded with numerous lakelets flooding the granite depressions, possessed no agricultural resources for the new city; on the other hand the prospects of trade and commerce did not correspond to the hope of the American immigrants, and most of the inhabitants had to disperse or return to their homes. The colony of southern blacks that had accompanied them still survives in the neighbourhood of Shelburne, notwithstanding the great difference between the climates of Nova Scotia and Virginia.

Beyond Shelburne the dangerous coast extending north-westwards in the direction of Halifax offers a succession of small havens, of which the busiest are *Liverpool* and *Lunenburg*, partly inhabited by immigrants from Germany. At the time when the British Government was expelling the Acadians, it was endeavouring to attract German settlers by granting them free gifts of land. Here and there in the vicinity of Lunenburg echoes of the German patois are heard amongst the older peasantry.

Halifax, capital and largest city of Nova Scotia, stands towards the middle of the east coast on the banks of a fjord which ramifies in several branches northwards, and which forms an excellent harbour, spacious enough to accommodate the largest fleets. The Indians called it *Shebucto*, that is, the "Chief Port," and the French gave it the name of *Baie Saine*. The original settlement, exclusively military, received in 1749 some colonists from Massachusetts; these were followed by a few German immigrants from Europe, but the civil population increased very slowly round about the citadel. The city, which is regularly built, but of a dull, mean aspect, extends along the west side of the harbour over against the suburb of *Dartmouth*, which occupies the amphitheatre of hills on the opposite side. Steam ferries ply between the two places, and a few men-of-war are generally riding at anchor in the harbour.

The formidable stronghold, which dominates the city from a height of 250 feet, occupies the summit of the neighbouring hill, and its batteries are so disposed as to develop a tremendous cross fire with those of Dartmouth, George Island, and the outer harbour. The estuary is skirted by arsenals, dockyards, slips, and repairing docks. Halifax, the best-appointed British naval station in the American waters, possesses a graving-dock 600 feet long and 100 wide, which is consequently larger

than that of Bermuda. Its barracks are occupied by a British regiment, the only regular troops still kept by the Imperial Government in the territory of the Dominion.

Being mainly a military town, with a large number of functionaries maintained at the charge of the Imperial Budget, Halifax is considered one of the least industrious places in the Confederacy, taking little advantage of its magnificent position on a peninsula projecting towards the Old World far beyond the normal coastline of the American continent. In 1887, an average year, not more than 4,153 trading vessels, with a total capacity of 843,000 tons, were entered at this port. Its most flourishing period was during the American War of Secession, when, under cover of neutrality, it smuggled contrabands of war into the Southern States, and gave a refuge to the Southern privateers.

The gold-mines, formerly worked in the immediate vicinity of Dartmouth and south-east of Halifax in the Gold River, are nearly exhausted. *Hammond's Plains*, a village in the environs of Halifax, is still inhabited by the black descendants of emancipated slaves which the British fleet transported in 1815 from Maryland and Virginia.

North-east of Halifax the rock-bound fjord-indented coastlands are nowhere very fertile. Thanks to the general poverty of the soil, the Acadians, returning to their ancestral homes after the War of Independence, were able to resume possession of their still unoccupied lands. One of these French colonies is settled at *Chezset-cook*, about 20 miles north-east of Halifax, while others occupy the shores of the Gut of Canso, between Nova Scotia and Cape Breton. Towards the year 1860 it was expected that these districts of Nova Scotia would be rapidly enriched, especially in the districts of *Ship-harbour*, *Tangier*, and *Sherbrooke*, where several auriferous deposits had been discovered. But this new source of wealth was soon exhausted by the speculators, and the country was again deserted.

Even the port of *Guysborough*, so conveniently situated at the head of Chedabucto Bay and at the eastern entrance of the Canso Channel, is nothing more than an obscure fishing-station. *Pictou*, the busiest place along the north coast, is the outport for the coal extracted from the mines of *New Glasgow* and *Stellarton*. The total output of all the Nova Scotia coal-pits exceeded 1,680,000 tons in the year 1886. The inhabitants of Pictou are to a great extent descendants of Highland settlers who still speak the Gaelic language amongst themselves.

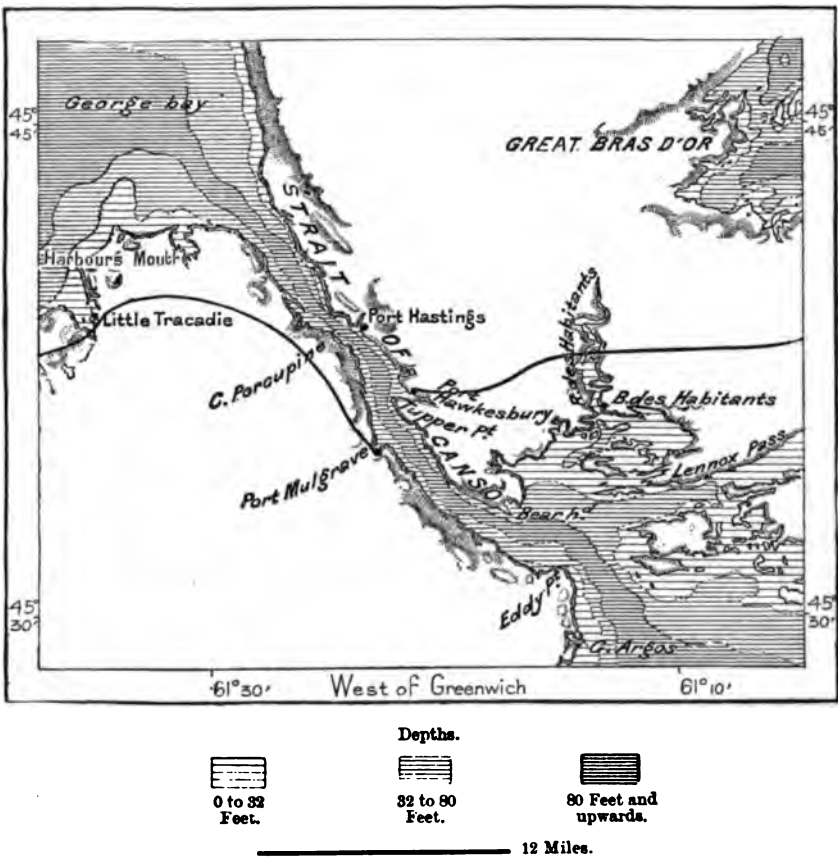
Antigonish, which lies between Pictou and the Canso Gut, is also a Highland colony, which contends with the surrounding Acadians for the ethnical supremacy in those districts. But both elements will probably ere long be swallowed up in the tide of cosmopolitan settlers, for capitalists are already planning the construction of a great commercial emporium at the entrance of the trade route formed by the Canso Channel. The little havens of *Port Mulgrave* on the south, and of *Port Hauckesbury* and *Port Hastings* on the north or Cape Breton side, will be replaced by a large seaport already named *Terminal City*, with extensive docks, magazines, warehouses, and railways, and with whatever else may be required by the thousands of vessels which yearly traverse this natural canal between the Atlantic and

the Gulf of St. Lawrence. One of the Transatlantic cables has its terminus at Port Hastings.

TOPOGRAPHY OF CAPE BRETON.

The little *Madame Island*, a member of the Cape Breton insular group, is one of those few Acadian lands which have exclusively preserved their early French population. These islanders, nearly all occupied with fishing and navigation, are grouped round the borough of *Arichat*, the chief fishing-station between Halifax

Fig. 161.—CANSO STRAIT.
Scale 1 : 600,000.



and St. John's of Newfoundland. Here also, as in the villages on the Bay of Chaleur, the fishers are in the hands of the Jersey speculators who have monopolised nearly all the shore fisheries in these waters.

North of *Madame Island* the old Acadian settlement of *St. Peter* (*Saint-Pierre*) has acquired some importance to the disadvantage of *Arichat*, thanks to a canal 880 yards long and 12 or 13 feet deep, which has been cut through a low isthmus, and which enables vessels to penetrate into the inland sea of *Bradore* (*Bras d'Or*),

and visit all the ports of the interior. By this important engineering work Cape Breton has been divided into two distinct islands. St. Peter, like most of the villages lying farther north and bearing French names, is now inhabited by Highlanders from the west of Scotland and the Hebrides. These Highlanders constitute the dominant element throughout the whole of Cape Breton, and they have kept more aloof from the other populations in the district of *Baddeck* (*Bédèque*), a town lying on the shores of the *Bras d'Or*. In the neighbourhood of *Baddeck* the Mic-Mac Indians also have best preserved their language and customs. On the north-west coast of Cape Breton lies the Acadian settlement of *Cheticamp*.

Sydney, formerly the capital and still the largest place in the province of Cape Breton, has been enriched by its traffic in the coal extracted from the mines of the surrounding district. These mines are connected by a network of railways with the docks and landing-stages of the port, which communicates by steam ferry-boats with *North Sydney* on the opposite side of the harbour. The coal-fields have been known and worked for the last two centuries, their chief markets being the manufacturing towns of New England. Even still nearly all the coals extracted from the Nova Scotia mines are exported to the United States, where they are chiefly used in the manufacture of gas.

Sydney is one of the places which hope to be selected as terminal stations of the Transatlantic trade with England; nor are its aspirations altogether groundless, for it is the easternmost of all the Canadian seaports. Unfortunately its harbour is blocked by ice for three months in the year. In the year 1888 its shipping had a total capacity of over one million tons, more than double that of any other Cape Breton or Nova Scotian seaport except Halifax.

Another more open seaport, and perhaps a more convenient station for the Transatlantic service, is the famous citadel of *Louisbourg*, which lies near the headland whence the island takes its name of Cape Breton. *Louisbourg*, the old "*Harre à l'Anglais*," was long the military key of the Nova Scotia and Newfoundland waters. During the years 1720-1740 the French had made it a formidable stronghold; but it was twice captured by the English, in 1745 and 1758, and then utilised by them as the base of the operations undertaken for the conquest of Canada. The grassy ramparts of the fortifications are still visible, though interrupted by broad gaps where the sheep now peacefully graze. A picturesque little hamlet lies under the sheltering walls of the citadel. A new town is also springing up on the north side of the old fortress, and for some years past the harbour has been used as a seaport; it is free from ice throughout the year, and in 1888 its shipping represented a total capacity of over 260,000 tons.

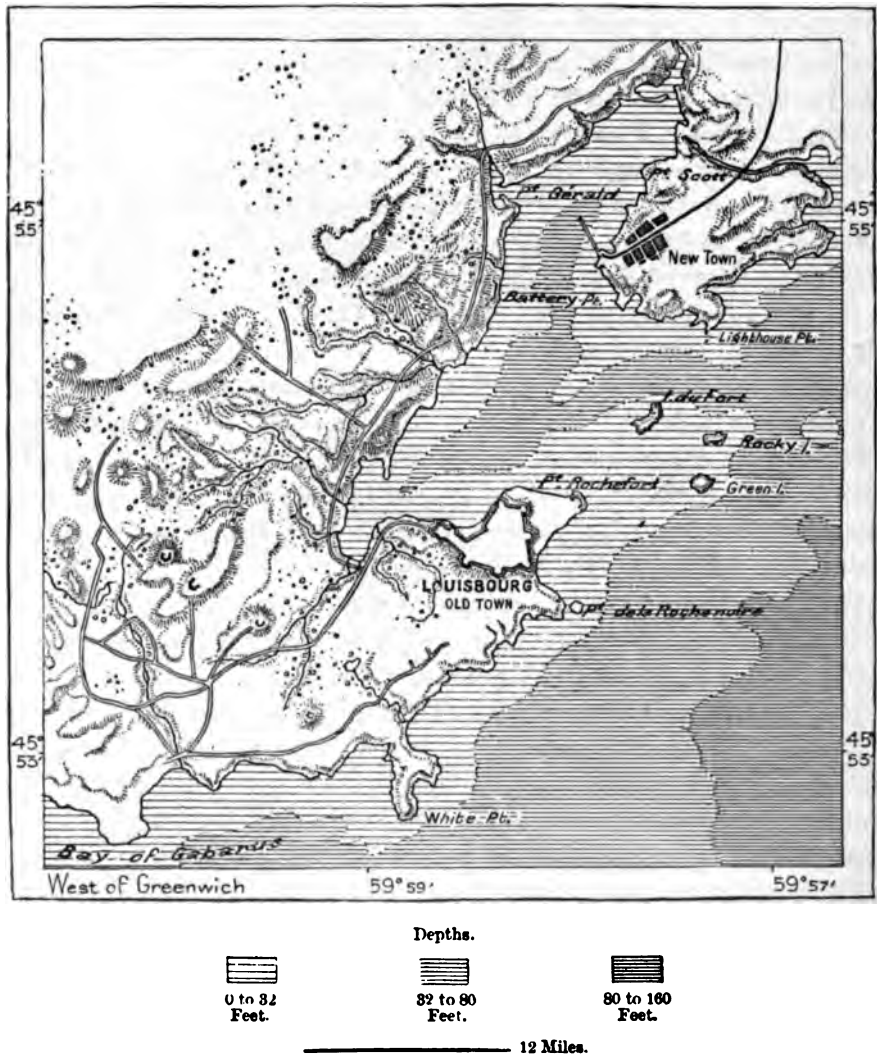
TOPOGRAPHY OF PRINCE EDWARD ISLAND.

In Prince Edward Island, which the French called the *Île Saint-Jean*, the dominant population is Scotch, but to a less degree than in Cape Breton; English has long superseded Gaelic as the chief language of intercourse. The Mic-Mac aborigines have been driven into the interior everywhere, except on the north

coast, where the little Lennox Island has been reserved for their exclusive use; here no whites are allowed to settle.

The Acadians, who were the first European settlers, suffered the same fate as their Nova Scotian kinsfolk, and under the same pretext of being a standing menace

Fig. 162.—LOUISBOURG.
Scale 1 : 70,000.

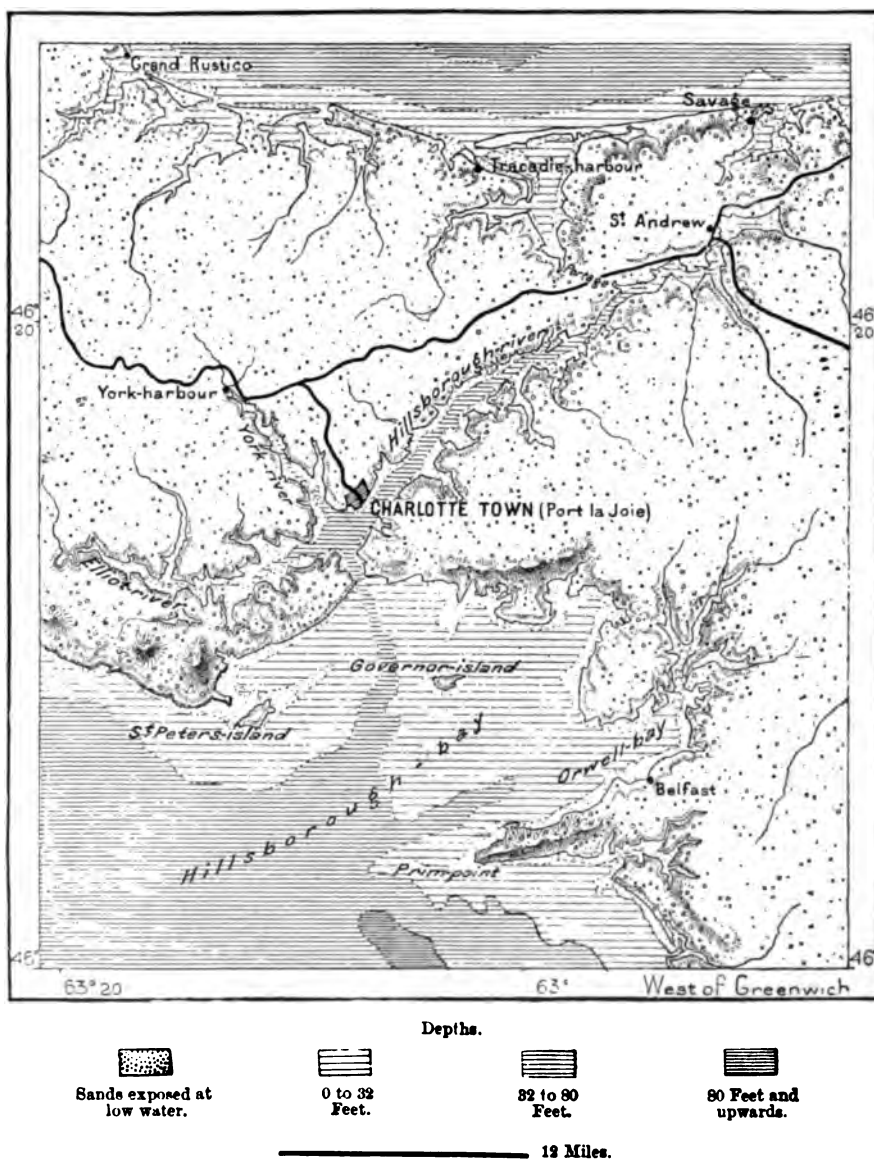


to the power of England. But after their expulsion, the sixty-seven persons, retired military officers or court favourites, amongst whom the British Government disposed of the island by lottery, found it difficult to bring under cultivation the 20,000 acres which fell to the lot of each. Many were fain to recall the French peasantry who had taken refuge in the forests, and reinstate them in

their holdings.* At present the Acadians are found in every part of the island ; but they are dominant only in the northern peninsula round about *Tignish*, a

Fig. 163.—CHARLOTTE TOWN AND ROADSTAD.

Scale 1 : 600,000.



village where begins the main line of railway running from one extremity to the other of the province.

The feudal organisation of property preventing the peasantry from becoming

* John Stewart, *An Account of Prince Edward Island*.

freeholders of the plots cultivated by them, long checked the agricultural development and general progress of this fertile island, which might easily be converted into a vast garden. Most of those who had received the original concessions abstained from recalling the Acadian exiles, and allowed their estates to lie fallow till after the American War of Independence. Then thousands of disbanded troops and of fugitive loyalists flocked to the island, and after the constitution of the Dominion lands had to be found for the colonists by spending £160,000 in buying back a portion of the domain which the royal caprice had so recklessly granted to a few favourites.

Charlotte-Town, capital of Prince Edward Island, lies on the south coast on a well-sheltered harbour which the Acadians named *Port La Joie*. As the centre of the provincial administration, Charlotte-Town has acquired exceptional importance, and its prosperity has given a stimulus to the trade of the neighbouring town of *Summerside*, which also lies on the south side of the island over against New Brunswick. Here are shipped large quantities of cereals grown on the fertile plains of the surrounding district, as well as oysters of excellent quality, which are raised farther east in Bedeque Bay.

Other centres of population are *Alberton*, about 40 miles from Summerside, on Cascumpec Bay, which is much frequented by fishing smacks during the season; *Georgetown*, about 30 miles east of Charlotte-Town, on the promontory at the confluence of the Cardigan and Brudenell rivers, with a fine harbour open far into the winter; lastly, *Souris*, the eastern terminus of the railway, 60 miles east of Charlotte-Town, the outlet for the exports of a large portion of King's County. *Souris* has also a commodious harbour, which has lately been much improved to meet the requirements of its increasing export trade.

Prince Edward Island has numerous orchards, but its primeval forests have all disappeared. The local breed of horses is highly prized by the Americans for their speed and other good qualities.

SABLE ISLAND.

Sable Island, which lies in 44° N. latitude, about 100 miles off the east coast of Nova Scotia, is distinguished especially for the remarkable changes of form which it has undergone during the short period of three centuries of its historic life. These changes, which are due to the action of marine currents and storms, may be studied on the charts taken at various periods. On the oldest French maps the island is represented as about 46 miles long, and about 3½ miles wide; and an English map of 1776 reduces it to no more than 11 or 12 miles in length, and 500 yards in width, and at the same time shifts the west point over 12 miles more to the east.

Further reductions and changes of position are figured on the charts of the years 1818, 1850, and 1888, and at present the island, affecting the form of a crescent, with its convex side facing southwards, is only 25½ by 1½ miles, while the west point has advanced 28 miles farther seawards; the high dunes also,

which formerly exceeded 200 feet, are now scarcely 80 feet in height. A lake in the interior has followed all these displacements of the sandy dunes and of the island itself, being at times completely separated from the sea, and again communicating with it through a channel. In 1836 two American sloops, which had taken refuge in this lake, were unable to get back again. From time to time the inhabitants displace their station and their lighthouse, and live in dread of the island being some day swept bodily away by the raging storm. Many acres of sandy shore have at times been swallowed up by the waves in a single night.

But while the island diminishes in size, the dangerous sandbank on which it rests does not appear to have been eroded by the sea. In stormy weather the waves break 7 or 8 and even 12 miles from the beach in shallows 65 or 70 feet deep. These breakers strike the stoutest hearts with awe, and are all the more dangerous in consequence of the continually shifting currents and the dense fogs prevailing in these waters. For weeks together, not a single boat is able to approach the island, and then only at the relatively sheltered inlet on the north side.

Sable Island has been called an "ocean graveyard;" since 1802, when a marine station was first established here, over a hundred and fifty shipwrecks have been recorded on the surrounding banks; but a much larger number of disasters were indicated, without being identified, by the nameless wreckage of other vessels. Thanks to the admirable organisation of the station, one of the best regulated in the world, most of the shipwrecked seafarers are rescued from a watery grave.

It is surprising that such a place could have been chosen as the site of one of the earliest essays at colonisation in America. The Marquis de la Roche, who had received from Henry IV. the concession and absolute control over Canada, began the work of colonisation by landing forty of his people on Sable Island, hoping to remove them again after finding a favourable place for tillage. This was in 1578, and seven years later twelve of these ill-fated persons were found still alive, but reduced to a state of savagery.* The present inhabitants are employed by an English company in raising a breed of ponies which graze in the grassy dells between the sandy dunes.†

VII.—LABRADOR.

This geographical name is used in diverse senses by different writers. It is applied in a general way to the whole of the peninsular region comprised between Hudson Strait, the Atlantic, the St. Lawrence Gulf and estuary; but it seems difficult to determine the limits of this vast territory on its landward side. According to the natural features of the ground the true frontier should be indicated by a line drawn from the mouth of Rupert River, in Hudson Bay, to the St. Lawrence and Saguenay confluence; but the political divisions interfere with this natural

* Garneau, Sulte, &c.

† Stuart-Fossard, *Bulletin de la Société de Géographie commerciale du Havre*, Nov.-Dec., 1888.

frontier, for the province of Quebec comprises a part of the territory extending farther north as far as 52° north latitude.

If this Canadian slice be regarded as distinct from Labrador, properly so called, as may be justified by the fact that it belongs to the Laurentian area of drainage, then the enormous triangular expanse pointing in the direction of the Arctic Archipelago, will still comprise a superficial area estimated at some 480,000 square miles, or about four times that of the British Isles. Nearly the whole of this space, which is scarcely known beyond its periphery, belongs to the Dominion of Canada, that part alone excepted which extends as far as Ungava Bay, below Hudson Strait, and which is claimed by the colony of Newfoundland as a prolongation of its fishing domain. This point, however, is not yet settled, for the original charter of Nova Scotia extends the jurisdiction of that colony as far as Hudson Strait on the mainland. As soon as the commercial and industrial resources of Labrador are sufficiently developed, the conterminous provinces will doubtless proceed to settle the question of its political frontiers.

Etymologists have much discussed, and will doubtless long continue to discuss, the origin and meaning of this word "Labrador." Its Latin appearance suggested to the old cartographers, the form *Terra Laboratoris*,* *Terra Agricola*.† But it may well be asked by what strange irony such a name could have been applied to a bleak and frozen region, where no husbandman had ever driven a plough into the soil, where Jacques Cartier saw not "as much earth as would fill a basket." No document left by the early navigators, who first visited the Labrador peninsula, justifies the supposition that they could have stultified themselves by giving to such an icy region a name having the sense of "land of the labourer." On the Labrador coast, says Mr. Randle F. Holme, "not a tree is to be seen; there is nothing there but bare rocks, and occasionally a little stunted grass. It is almost perpetual winter."‡

Biddle, whose hypothesis is adopted by the historian, Parkman, suggests that, at the time of his first voyage in 1500, Gaspar Cortereal captured a certain number of natives and carried them off to work on the Portuguese plantations. Labrador would thus have received its name as being a good field for recruiting the labour market. But although this supposition may be justified by the conduct of most seafaring peoples at that epoch, it is unsupported by any extant records or despatches of the Lusitanian navigator; nor would an Arctic land, thinly occupied by a few fishing and hunting communities, have been a very promising region from which to procure hands for subtropical plantations. Others have identified the word Labrador with Labour, the name of a district at the foot of the western Pyrenees, and have endeavoured, on this ground, to show that the American "Labour" must have been discovered by Basque navigators.§ A tradition is also current amongst the Canadians settled on the seaboard, according to which a

* Map reproduced by Kunstmann, *Entdeckung Amerika's*.

† Sebastian Münster, *Cosmographia*.

‡ *A Journey into the Interior of Labrador*, Proceedings of the R. Geographical Society, April, 1883.

§ P. Margry, *Les Navigations françaises*.

Basque or a Portuguese, named Labrador, was the first navigator to reach these waters, having preceded even the Cortereals themselves. But history knows nothing of this explorer; nor has it preserved any trace of the expression "bras d'or," supposed to have been generally applied by the French seafarers to all those marine passages which they found to be easily navigated.

Nevertheless, it is certain that several inlets in these waters, notably at Cape Breton, and on the Labrador seaboard, bear such names as "Bras d'Or," Bradore, Brador, and Bradaur. On the maps of the eighteenth century, the inland sea in Cape Breton bears the name of Labrador, while the two approaches are respectively called "Great" and "Little" Labrador. The inlet indenting the coast of the mainland near the southern entrance of Belle-Isle Strait is specially known by the name of "Bradore Bay," and this is the very place where, before the colonisation of Canada, the fishers assembled in the largest numbers, and where they founded the station of Brest. It would accordingly seem reasonable to suppose that this word Brador, whence Labrador, had some local origin, deriving perhaps from a native (Algonquin) word with the meaning of strait, sound, bay, or creek.*

GEOGRAPHICAL RESEARCH.

Of all the regions comprised within the vast domain of the Dominion, Labrador has been the least explored. Even the tundras bordering on the Arctic seas in the far north have been more frequently visited by travellers. Judging by their title-pages, a considerable number of works would seem to contain narratives of journeys made in Labrador; but most of these works have reference only to the "Canadian Labrador," that is, to the western extremity of the province of Quebec, and even that region itself is but very imperfectly known. The only persons who have penetrated far into the interior beyond the height of land are the Indians, a few missionaries, and some agents of the Hudson Bay Company. Then the Canadian priest, Lacasse, curé of the parish of Mingan on the south coast opposite the island of Anticosti, traversed the country from south to north as far as Ungava Bay. In 1838 and 1841 the trader Maclean crossed the north-eastern region between Ungava Bay and Hamilton Inlet; about the year 1860 Mr. Kennedy, another of the Company's agents, visited a part of the same country, and these are the only two white men who are known to have ever seen the famous Grand Falls on the Grand River before the year 1888. In 1884 the Protestant missionary, Peck, succeeded in crossing from the shores of Hudson Bay to Ungava Bay by ascending the Little Whale River to the plateau, and descending by the valley of the Koksoak (Big or South River).

The various expeditions sent to Lake Mistassini have contributed to enlarge our knowledge of the approaches to Labrador proper; but most of the itineraries have yielded very meagre geographical data, and even these have not yet been entirely harmonised. So little light has been thrown upon the real configuration

* Jules Marcou, *Bulletin de la Société de Géographie*, 1898.

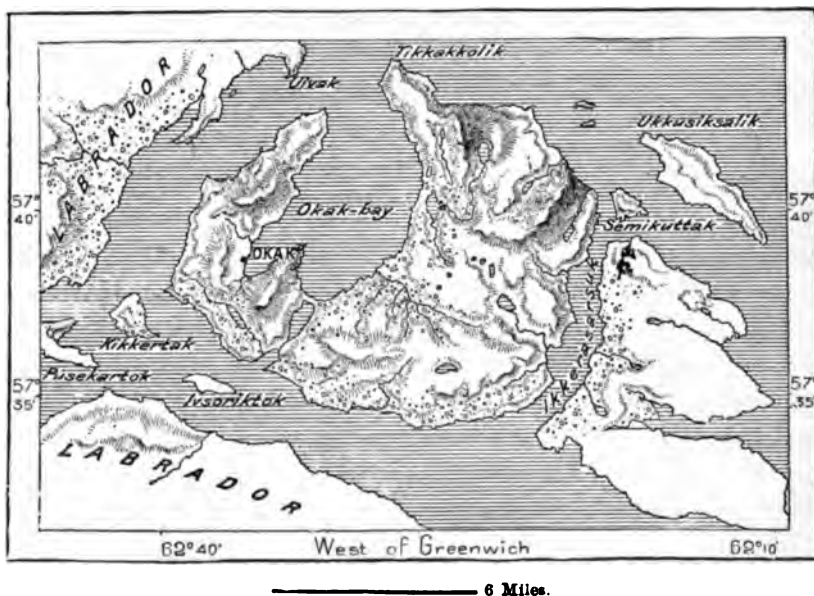
of the interior that report still speaks of unknown lakes, "as large as Ontario," which are said to exist about the centre of the peninsula, but which have not been assigned to any particular fluvial basin.

PHYSICAL FEATURES.

The most elevated part of Labrador is probably the eastern section which stretches along the Atlantic coast from Belle-Isle Strait northwards to Cape Chudleigh at the entrance of Hudson Strait and Ungava Bay. North of the strait the hills on the coast terminate in abrupt escarpments; they have a mean altitude

Fig. 164. --OKAK ISLAND.

Scale 1 : 300,000.



of not more than 350 or 400 feet, but snow-clad summits are visible in the distance. Heights bearing the name of mountains are seen only in the neighbourhood of Sandwich Harbour, where the igneous Mealy Mountains terminate seawards in a peak 1,480 feet high. According to Holme this range trends south-westwards in the direction of the Gulf of St. Lawrence, thus forming the southern escarpment of the inland plateaux which are bounded on the east side by the coast range.

This coast range begins near the head of the narrow gullet known as Hamilton Inlet, and rises gradually in the direction of the north. Here follow several eminences terminating in bold crests or sharp pyramidal peaks, some of which attain an altitude of nearly 6,500 feet. Nevertheless this chain, taken as a whole, is far less elevated than the nearly parallel range skirting the south-west coast of Greenland on the opposite side of Davis Strait. The insular headland of Cape

Chudleigh rises to a height of 1,650 feet, and beyond this point the system reappears in Resolution Island and the coast range skirting the east side of Baffin Land.

The eastern mountains of Labrador consist mainly of granites and gneisses, and the presence of porphyries has also been determined by the naturalist, Lieber.* Several mountains terminate in open cavities, presenting the form of breached craters; yet the character of the rocks shows that they cannot be volcanoes. These crater-like formations are supposed to be due to the long persistence of the snows which gradually soften and decompose the rocks and clays, thus in the course of ages carving them into vast amphitheatres. The granitic island of Okak on the east coast north of Nain is one of these so-called craters now half submerged in the Atlantic.

Pieces of pumice are occasionally picked up on the Labrador coast; but these floating fragments of scorix are not of local origin, but have drifted with the marine currents westwards from Iceland. The blocks of labradorite, mostly blue or green, very rarely red, have nowhere been discovered in the cliffs, but are always found in fragments of varying size scattered along the marine and lacustrine shores. The Eskimo often bring specimens from an inland basin lying to the west of Nain, and this mineral is also very common about the entrance of Hamilton Inlet; huge boulders of it lie about the beach, and Holme states that he sailed from the North-West River down to Rigolet at the narrows above the Inlet "in a schooner entirely ballasted with this beautiful stone."

LAKES AND RIVERS FLOWING TO THE ATLANTIC AND UNGAVA BAY.

West of the coast range the whole of east Labrador is occupied by a mountainous tableland studded with lakes and furrowed by rivers. According to Hind and Holme these uplands have a probable elevation of over 2,000 feet above the sea. The surface is strewn with rocky fragments worn by weathering, or looking as if they had been rolled by flood waters. North and west the ground slopes gradually, presenting a uniform incline to the streams flowing towards Hudson Strait and Hudson Bay. But towards the south and south-east the fall is much more precipitous, and here the running waters develop cascades and rapids. Thus the rivers of Canadian Labrador rush over a continuous succession of cataracts, none of which, however, can compare in magnitude with those of the Grand River flowing to Hamilton Inlet.

Neither Maclean nor Kennedy gives the height of the Grand Falls, which would appear to have a drop of at least 1,000 feet. At this point, which is 230 miles from the sea, the river, fed by a string of lakes disposed in the direction from north to south on the plateau, is already a considerable stream, being 500 yards broad above the falls, and suddenly contracting to 50 yards before plunging into the chasm. According to Holme the Indians have a superstitious dread of

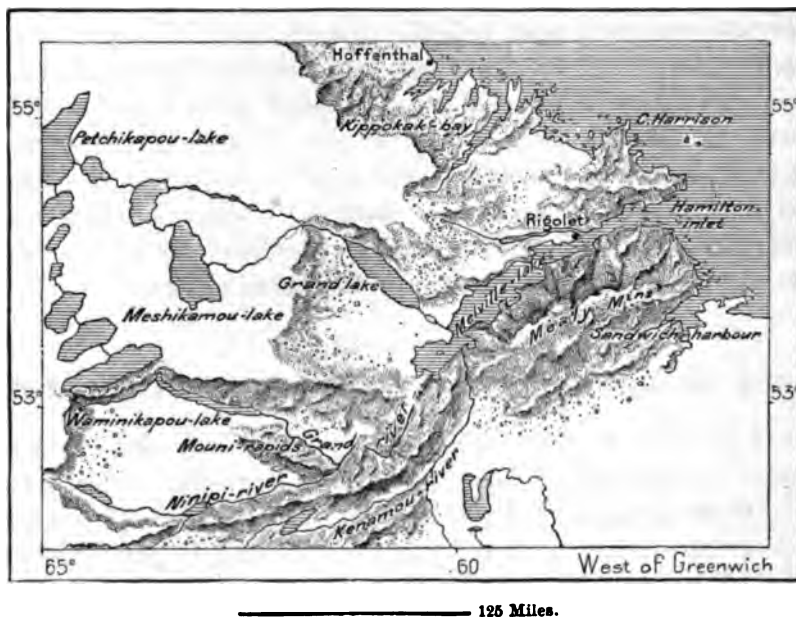
* O. M. Lieber, *Petermann's Mitteilungen*, 1861.

the falls, believing them to be haunted, and as they also suppose that no one can look upon them and live, they carefully avoid them. Kennedy was guided to the spot not by a native of the district, but by an Iroquois from Montreal, who did not entirely share the Labrador Indian superstitions. The Montagnais scarcely ever venture beyond Lake Waminikapou, a crescent-shaped basin which fills a narrow crescent-shaped valley about 40 miles long traversed by the Grand River.

Farther down the river forms various other rapids but only one cascade, consisting of two stages with a total drop of 70 feet. A little below these falls the river expands into the broad basin of Melville, or Big Bay, apparently a land-locked sheet of water, but really communicating through a "rigolet," or narrow

Fig. 165.—AFFLUENTS OF MELVILLE BAY.

Scale 1: 10,000,000.



gullet, with Hamilton Inlet and the ocean. The various sections of the inlet have a total length of no less than 150 miles.

Besides the Grand River, Melville Bay receives other affluents, one of the largest of which is the Nascopi, which descends from the north-west through a long chain of lakes, one of which it traverses just before entering the marine estuary.

The maps of Labrador based on the reports of the Indians and traders show an uninterrupted network of lakes and rivers all communicating with each other and draining in three different directions, towards the Gulf of St. Lawrence, the Atlantic, and Ungava Bay. It is highly probable that these statements are incorrect, and that the communications from slope to slope are made not by fluvial channels or by lakes with double outflow, but as elsewhere by portages. All such

primitive maps, from that of the Garden of Eden and the "tables" of the ancients which represented the Danube as discharging through two mouths into the Black Sea and the Adriatic, down to those of mediæval times with their two or three African Niles running wildly over the continent, invariably show in the interior of every country one or more reservoirs with a multiplicity of divergent emissaries. Even in the beginning of the present century Chateaubriand speaks with enthusiasm of that common source of four rivers, the Mississippi, which disappears southwards in the Gulf of Mexico, the St. Lawrence which flows eastwards to the Atlantic, the "Outawais," which trends northwards to the polar seas, and "the western stream which carries to the setting sun the tribute of its floods for the ocean of Noutouka."*

North of Hamilton Inlet, whose affluents pierce the outer escarpments of the plateau, the eastern slope of the coast range is too narrow for the development of any large fluvial basins with lateral arteries. Hence the seaboard here presents nothing but a succession of fjords, inlets, islands, and islets without any large river estuaries. But on the western slope there has been ample space for the formation of extensive watercourses. Such is the Koksoak, the Big or South River of English writers, which reaches the coast at the head of Ungava Bay. It rises in the same part of the plateau as the Grand River of the eastern slope, with which it is represented by certain rudimentary and obviously erroneous maps as communicating through several strings of lakes. Were this the case the eastern coast range would be completely isolated by a continuous channel of alternating fluvial and lacustrine depressions. In any case it is at least certain that the Koksoak is fed by a large number of very extensive lakes, amongst others the Meshikamou, the Petchikapou, and the Kaniapuskaw.

LAKES AND RIVERS FLOWING TO HUDSON BAY.

The western slope, which belongs to the catchment basin of Hudson Bay, comprises over one-half of the whole of Labrador. Accordingly the watercourses are here both numerous and of great length. According to the reports of the trappers most of them flow in parallel valleys all sloping from east to west at right angles with the shore line. This slope has also its Big River, a very copious stream, which is exceeded in volume only by the Churchill and Nelson of all the affluents of Hudson Bay.

South of the Big River the chief tributaries of James Bay are the East Main, which about coincides with the official boundary of the province of Quebec, and Rupert's River, the emissary of Lake Mistassini. North of the Big River flow to Hudson Bay, properly so called, the Great Whale, the Little Whale, the Clear-water, and the Nastapoka. The Clear-water, emissary of the lake of like name, falls into a large basin, called Richmond Gulf, which communicates with Hudson Bay through a passage too narrow to allow of the free play of the tidal current. Hence the formation of swift rapids and whirlpools, where the Indians never venture in their canoes during the ebb tides. But owing to this constant agitation

* *Voyage en Amérique.*

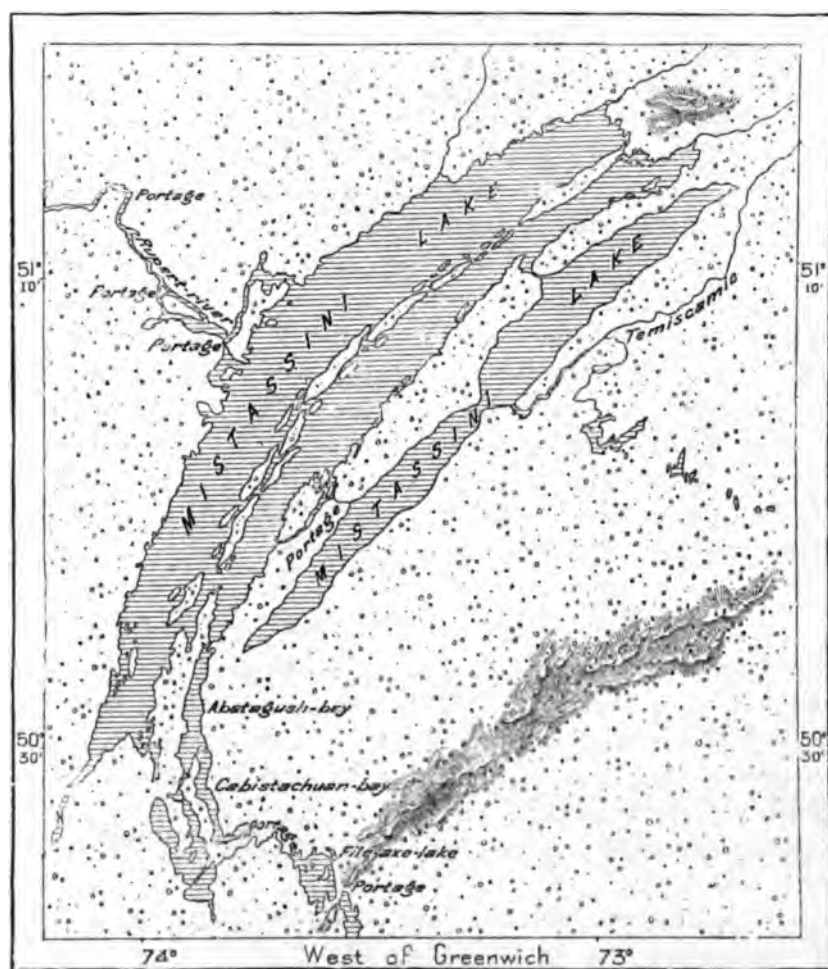
of the waters the estuary is never frozen in winter, and is consequently frequented by multitudes of waders, seals, and porpoises.

LAKE MISTASSINI.

Lake Mistassini, the "Great King," or the "Great Stone," lies north of the sources of the St. Maurice and Saguenay Rivers on the Hudson Bay slope of the

Fig. 166.—LAKE MISTASSINI.

Scale 1 : 1,200,000.



height of land, and within the part of Labrador assigned to Quebec. It is one of the great lakes of the Montagnais country, perhaps the largest and certainly the most famous. Mistassini was long the subject of mysterious legends, doubtless because, after having been several times visited by hunters and missionaries, it was again lost sight of under the jealous administration of the Hudson Bay Company. In 1672 it was explored by the missionary, Albanel, who afterwards made his way

down its emissary, Rupert's River, to Hudson Bay. At the end of the last century the botanist, André Michaux, had already studied the flora of its basin. But systematic exploration was reserved for recent times, when Low, Bignell, Loudon, and Macdonald succeeded in crossing the forty-one portages which separate Mistassini from St. John Lake. Henceforth the form of the mysterious basin is known in a general way, and the maps which have been prepared by various observers differ little from each other.

Grand Mistassini, as the chief basin is called, develops a crescent about 100 miles long with its convex side facing north-westwards, and sending its overflow through Rupert's River at the highest part of the curve. In a line with the longitudinal axis is disposed a regular chain of islands, which also affects the form of a crescent. These islands divide the main into two secondary basins, while a third, called the Little Mistassini, is separated on the east side from both by an isthmus pierced by channels and also forming an arc of a circle concentric with the islands. The two lakes resemble one another in their crystal waters, general contours, and surrounding forests, where the birch is the prevailing species.

The soundings have revealed a depth of 370 feet towards the centre of Great Mistassini, and in this lake is situated the famous "Great Stone," from which the whole basin takes its name. The storms arise, say the Montagnais Indians, round about this spirit rock, which no one can look on and live.*

CLIMATE OF LABRADOR.

Throughout nearly the whole of its extent Labrador lies under more southern latitudes than Greenland. It extends beyond 60° over against the southernmost extremity of Greenland only at the two terminal points of Cape Chudleigh and Cape Wostenholme. Nevertheless its climate is more severe; at least the mountainous region lying nearest to the Atlantic seaboard is certainly colder than the peninsular region on the east side of Davis Strait, its mean annual temperature falling several degrees below freezing-point. This contrast is due mainly to the fact that the east coast of Labrador is fully exposed to the north-east polar winds. Moreover, the ice-floes drifting southwards with the current from Baffin Bay come into collision with those issuing from Hudson Strait, and the whole united mass is driven by wind and waves to the Labrador seaboard.

Summer begins in June, when the last fragments of the ice-pack disappear, but the really warm weather scarcely lasts more than about thirty days. Winter usually returns in September, when the torrents, liberated for a brief period from their icy fetters, are again silent, and the water frozen down to the fluvial bed. Even summer, despite the relative mildness of its temperature, is by no means a pleasant season, owing to the abrupt changes from hot days to cold nights. When the wind suddenly shifts oscillations of 35 or 40 degrees have been recorded within the twenty-four hours.

* *Bulletin of the Quebec Geographical Society, 1886.*

Nevertheless the climate of the interior, even within a distance of 12 miles from the sea, differs greatly from that of the coast. It escapes the keen blasts blowing from the ice floes, and in many places a complete change of climate may be had by simply crossing the coast range. Hence the continuous records made since the year 1882 at the meteorological stations on the sea-coast have only a local value.*

After the long winter, excursions of even a few hours are extremely laborious on the Labrador seaboard and height of land. The melting snows fill the depressions with sludge and convert the ground to a morass; the streams overflow their banks; the bog-waters well up in all directions; myriads of flies and mosquitoes, described as worse in Labrador than in any other country, blacken the air and devour the wayfarer. Hence the traveller prefers the bright winter days, the hard tracks, the frozen surface of lakes and rivers presenting free scope for sledging.

Whenever the Canadians seriously undertake the geological exploration of Labrador, the work, however arduous it may be, will be found perfectly feasible. In the interior no point lies more than 350 miles in a straight line from some bay or inlet on the surrounding coasts; provisions and supplies might also be safely stored in several places of the interior at considerable distances from the seaboard.

FLORA AND FAUNA.

Apart from a few differences of detail, Labrador presents much the same botanical and zoological conditions as the northern regions lying beyond Hudson Bay. In the southern districts along the frontier of Canadian Labrador the slopes of the mountains are covered with forests, and these forests consist of fine trees, nearly all conifers, with very slender trunks compared with their height. Near the centre of the peninsula these trees decrease in size and become far less dense. Reichel speaks of splendid beeches near Nain, Okak, and Hoffenthal (Hopedale) on the east coast. Berries also, of excellent quality, especially the whortleberry and the cranberry, abound in many districts where the forests have been destroyed by fire.

Towards 57° or 58° north latitude all the woodlands are replaced by the tundra; but even here in the sheltered places may still be seen stunted trees or shrubs, the juniper, beech or the willow, besides grassy tracts and flowering plants, amongst which the *ledum palustre*, or "Labrador tea." But usually nothing is visible except the caribou moss, which covers the rocks as with a coating of green. The missionaries on the coast are able to cultivate their little garden plots by prepar-

* Temperature of various places on the Labrador coasts:—

	Latitude.	Hottest Month (July).	Colest Month (January).	Mean Temp.
Hoffenthal (Hopedale)	55° 27'	54° F.	11° F.	23° F.
Nain	56° 33'	50°	13°	21°
Okak	57° 34'	49°	12°	19°
Rama	58° 53'	45°	13°	20°
Fort Chimuo	58° 28'	—	19°	—

ing the ground with sand mixed with decaying seaweed. At the more southerly stations of Nain and Hopedale they thus succeed, by dint of much care, in raising cabbages, cauliflowers, radishes and lettuces; they also grow the potato, but the ridges have nearly every night to be protected from the frost.

Holme concludes generally that "as an agricultural or pastoral country Labrador has no prospects; and unless its mineral resources are some day turned to account, I cannot see that the country will ever be very different from what it is now."

The wild animals are the same as those in the far north—reindeer, caribou, musk ox, bears, wolves, foxes, otters, and other smaller fur-bearing animals, except the beaver, which the trappers have scarcely ever met.* The caribou has already become rare in the southern parts of the country, and several of the Hudson Bay Company's stations having ceased to yield any peltries have had to be abandoned. Reptiles are very rare, although a harmless snake is still met on the northern plateaux, and three species of frogs are found in the marshes near Ungava Bay.

Dogs are kept by the natives of the interior for hunting the porcupine, which, with ptarmigan and fish from the lakes, constitutes their chief nutriment. Those dwelling on the seaboard depend on the sea and on the same fishes that attract the Newfoundland fishers during the open season. No domestic cattle are bred, and, according to Holme, there was only one cow in 1887 on the whole of the east coast in the south-west corner of Hamilton Inlet; not a single horse, sheep, or goat. The reason for this is that Eskimo dogs are a necessity and are kept in large numbers, but are so ferocious that it is almost impossible to keep any other kind of animal in association with them. Some insects, such as the common house-fly, elsewhere the usual companion of the white man, have not followed him to Labrador.

INHABITANTS OF LABRADOR.

Like the North-West Territory the north-east region of Labrador yields sufficient supplies for a few wandering groups of Indians and Eskimo, the former chiefly in the southern districts, the latter on the eastern and northern shores of the peninsula. Altogether the population of Labrador north of the height of land probably does not exceed 10,000 souls. A census taken by the Newfoundland Government returned for the east coast, from Blanc Sablon at the Canadian frontier to Cape Chudleigh, a total of 4,211 Indians, Eskimo, whites, and half-breeds.

The Indians, who inhabit the forests and the shores of the lakes, belong to the great Kree nation, and are divided into two families, the Montagnais, akin to those settled round Lake St. John, and the Nascopi, or "Men."† The latter, who number only a few hundred altogether, wander round the lacustrine basin to which they give their name; but they also traverse every part of Labrador, either passing

* Holme, however, mentions the beaver as one of the fur animals commonly trapped in Labrador. His list includes the black bear, wolf, wolverine, lynx (or mountain cat) red, white, blue, and silver fox, otter, beaver, marten, musquash, and mink.

† Stearns, *Labrador*.

from lake to lake in their bark canoes, or else plodding heavily but unwearily over the snowy wastes in their clumsy snow-shoes. They are seldom seen at the Company's stations, and they generally keep aloof from the whites, so that very few half-breeds are found amongst them. They live in wigwams covered with birch-bark or with caribou skins, and in winter they heap up the snow in dense masses round about their dwellings.

Like the other still uncivilised Indian tribes, the Nascopis subject the young men to severe trials, especially to that of hunger, before admitting them to rank as equals; the periods of long fasts are often renewed during this time of probation. The terrible custom of despatching the aged and infirm still prevails amongst the Nascopis; to the son, the brother, or the most intimate friend of the victim is assigned the duty of performing this pious but painful office.

Formerly the Indians and Eskimo were continually at war, and the former usually had the advantage in their conflicts. Eskimo Island, about 12 miles inland from Hamilton Inlet, is pointed out as the scene of a legendary battle between the hereditary foes, the cause of contention on this occasion being the assertion of the Indians that the Great Spirit had drawn a natural boundary between the respective territories of the two races, all the forest-clad land belonging to the Indians, and all the barren, treeless tundras to the Eskimo. But the latter objected to this arrangement, whereupon a great battle was fought to decide the point at issue. The tradition appears to be confirmed by the large number of Eskimo graves discovered on the island by Holme. These graves were of the usual Eskimo type, rough unhewn blocks of stone heaped together in an oblong form, the inside space measuring 2 by 1½ feet. Many had been disturbed by wolves and bears, but most of them still contained human remains. According to the tradition the Indians were again victorious.

The Norsemen also were constantly at war with the "Skrällinger," that is, the Labrador Eskimo, during their expeditions to the American mainland. In the middle of the eighteenth century these Eskimo still occupied several inlets on the coast of the Canadian Labrador, where they dwelt in harmony with the French fishers, of whom they called themselves "friends and comrades." Certain islands and a bay in the Gulf of St. Lawrence still bear Eskimo names; but at present few of this race are found farther south than Hamilton Inlet, which may now be regarded as the southern limit of their domain. On its shores dwell several Eskimo families, while the whole coast stretching thence north-westwards to Cape Chudleigh belongs exclusively to them.

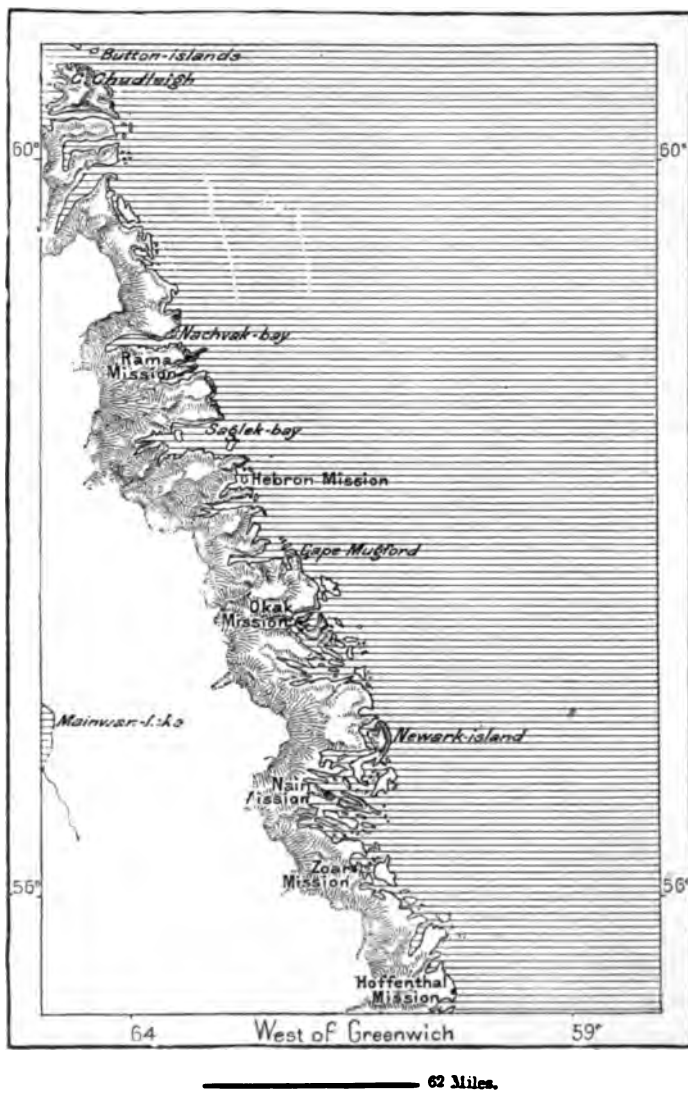
They differ little in appearance and language from the Eskimo peoples of Greenland and the Polar Archipelago. From the latter they are separated by the by no means impassable barrier of Hudson Strait. Maclean met at one of the Labrador stations some Innuits who had ventured across the channel on a raft made of irregular logs of driftwood. On the east coast they are generally of small size, the average height not exceeding five feet. But those of the west coast are taller and more robust, and for the most part have not only an abundant head of hair, but also a fully developed beard reaching down to the breast. This feature is

doubtless due to the numerous crossings with the whites, several villages being entirely inhabited by half-breeds.

Like the missionaries residing with them, they are much inclined to corpulence. Mortality is excessive amongst the children, especially since the introduction of

Fig. 167.—MORAVIAN MISSIONS ON THE LABRADOR COAST.

Scale 1 : 3,000,000.



the European diet, that is, flour and potatoes. The race is supposed to be dying out, although the Christian communities administered by the Moravian missionaries still number from 1,200 to 1,400, as formerly. At the last census they were 1,347 altogether.

THE MORAVIAN MISSIONS.

For over a century the most inclement seaboard of Labrador has been inhabited by whites, members of the Moravian missions. So early as 1752 a "brother" of this community endeavoured to found a station on one of the inlets on this inhospitable coast; but he was murdered together with five sailors, and the mission was not resumed till the year 1770. Three stations were successively established, first at Nain, about the middle of the north-east coast, then at Okak, an island close to the shore 100 miles farther north; lastly, at Hoffenthal (Hopedale), an inlet about the same distance from Nain, but in the opposite or south-east direction. In 1830 the Moravians founded a fourth mission still farther north, that of Hebron, near the neck of the extreme peninsula, which projects northwards between Ungava Bay and the Atlantic. Since then two more stations have been added to the group, Rama, north of Hebron, and Zoar, between Nain and Hopedale.

At certain seasons more than three-fourths of all the eastern Eskimo are grouped round the six Moravian stations, whose population ranges from about 30 souls (Rama) to 350 (Okak). Thus at Christmas and during the first weeks of the new year all reside in their winter habitations in the vicinity of the church and the pastor's dwelling, and at that time they are chiefly engaged in trapping foxes, hunting birds, or chopping wood. Then follows in February the seal-hunting season, after which they return about Easter to the stations, penetrating thence into the interior in pursuit of the reindeer. In June they return to the coast to collect the eggs of sea-gulls and other birds on the rocks and islands, and spend the close of the year in fishing.

Considerable changes have taken place in these Eskimo communities since the frequent visits of white sailors and fishers to the stations. Most of the natives now dress in the European style, and garments of cloth have replaced their former sealskin costume. Nor do their habitations any longer consist of huts made of earth and sods or even of hardened snow, resembling in form as well as in the structure and arrangement of the approaches, those underground chambers or burrows approached by galleries which are still seen in various Scandinavian regions. They now build European houses with planks and joists, which they furnish with beds, tables, carpets, rugs, looking-glasses, clocks, lamps, and other articles imported from England or the United States. They now drink nothing but tea, the use of all alcoholic liquors being interdicted. Formerly hunters, they are now chiefly fishers, but have, for the most part, abandoned the frail and unseaworthy kayak for boats constructed on the European model, and even sailing-vessels of considerable size. The most popular game is football, introduced by the English and joined in by both sexes, the women often carrying their infants on their backs.*

Hopedale has become a small fishing-port, where as many as fifty-six smacks of modern build were entered in the year 1875. The old religious ceremonies formerly conducted by the *angokok*, or native priests, have long disappeared in

* F. F. Payne, *The Eskimos of Hudson Strait*.

the neighbourhood of the missions. Nor are the former funeral customs any longer practised, although the Eskimo still regard with superstitious reverence the stone enclosures of the dolmens containing the remains of their forefathers. But while the natives have thus become civilised, they have in some respects been deteriorated; at least, the solidarity no longer exists which formerly prevailed amongst all the members of the same clan. The dangers and the products of the hunt and fishing are no longer shared in common by the whole community, and this spirit of fellow-feeling is now replaced by the European moral law, "Every man for himself."

THE STATIONS OF THE HUDSON BAY COMPANY.

Besides the German Moravians, English missionaries have also established themselves at some of the stations in the vicinity of Newfoundland. Other whites, accompanied by Canadian half-breeds and Iroquois Indians from the St. Lawrence, occupy the posts of the Hudson Bay Company, which have been founded at long intervals round the shores of the Atlantic and Hudson Bay. *Fort Chimmo*, one of the remotest of these stations, lies near the head of Ungava Bay on the banks of the lower Koksoak, where the tides rise as high as 40 feet. This establishment, which had been founded in 1828, was afterwards abandoned by the Company, owing to the difficulty of keeping up the communications in those dangerous waters. But it was reoccupied in the year 1866, and since then it is frequented by the Newfoundland fishers who come to pursue the whale in Hudson Bay and to trade with the surrounding Eskimo tribes.

Fort Nascopi, the most central of all those belonging to the Company, has also been deserted since 1864; it stood on the west side of Lake Petchikapou, about midway between Ungava Bay and the Gulf of St. Lawrence. At present the most inland of the Company's stations is that of *North-West River*, so called because it lies north-west of Melville Bay on the emissary of Grand Lake, which is fed by the river Nascopi; it is surrounded by the huts of a few Eskimo half-breeds.

Lower down, the important station of *Rigolet* has been founded on the north side of the narrows through which Melville Bay communicates with the outer basin of Hamilton Inlet. This is a great rendezvous for the seafarers engaged in the cod-fisheries of the Labrador waters. The village of *Southbrook*, still figuring on some maps as an inner port of Hamilton Inlet, at the confluence of the Kenamou River, has ceased to exist. Some years ago the last vestige of the village was obliterated by the erosions of the sea, which is constantly encroaching on the land in this direction.

THE LABRADOR FISHERIES.

During the summer months, and generally from June to October, the Labrador fishing-grounds attract large numbers of fishers from England and Newfoundland; at the height of the season, the literally "floating" population of this seaboard may be estimated at about 30,000, and to these must be added all the Eskimo

and half-breeds who congregate about the stations and curing-places. Every creek and inlet, every beach on the islands and mainland, suitable for the purpose, is temporarily occupied by drying-sheds and platforms, which are later covered with the winter snows. A steamer plies regularly between Nain and Newfoundland, and other craft keep up the communications between the fishing-stations along the coast.

Formerly, the Newfoundland fishers ventured no farther north than *Sandwich Harbour*, the headlands of the Mealy Mountains marking the extreme limits of their explorations. But about the year 1830, some bold navigators pushed forward as far as Hamilton Inlet, and thus the fishing-grounds were gradually extended from inlet to inlet as far as Cape Chudleigh, terminal headland on the Atlantic coast. It was discovered that the cod-banks occupy all the waters of the sounds and fjords, and even the channels winding between the groups of islands and islets along the seaboard, as well as the outer submarine banks, where the icebergs are grounded in depths of from 25 to 35 fathoms. Altogether, these Labrador fisheries comprise an available space of about 7,000 square miles, and are consequently more extensive than those of the great bank of Newfoundland itself. The annual value of the produce is estimated at nearly a million sterling.

The early fishers visited these waters with little hope of finding an abundance of cod so far north, as the more common animal forms, such as herrings and capelans, on which the cod feeds, gradually diminish in the direction of these higher latitudes, until at last they disappear altogether. They were not then aware that in the boreal seas the cod finds an ample supply of other food, such as numerous species of crustaceans and jelly-fish which swarm in the straits and sounds round about the stranded icebergs. The myriads of minute organisms which change the colour of the marine water in the neighbourhood of the ice-floes afford nutriment to the medusæ, which in their turn are devoured by the cod, which is again so largely consumed by man, and especially by the Mediterranean peoples.

The fishing season is gradually shortened in the direction of the polar seas. Thus it lasts, on an average, about 140 days on the Newfoundland Banks, but not more than two months in the neighbourhood of Cape Chudleigh. According to Henry J. Hind, each degree of latitude corresponds to a week's delay in the appearance of the shoals of cod.* The fishermen do not remain throughout the winter season on the northern shores of Labrador; but, on the south coast, those of Newfoundland have permanent settlements on the estuaries of the salmon rivers. In winter they are chiefly employed in trapping the fur-bearing animals.

Salmon is becoming rare on the east coast of Labrador, and dense shoals are now met only in Hudson Strait and Ungava Bay, beyond Cape Chudleigh. Salmon-peel and trout, however, are still abundant everywhere; whitefish is also common, and is preferred by many to salmon itself. In Hudson Strait whales are occasionally stranded. When the Eskimo succeed in capturing one of these huge

* *Official Report on the Fishing-Grounds of Northern Labrador, 1876.*



FISHING STATION ON THE EAST COAST OF LABRADOR.



cetaceans, they observe a strict fast for four-and-twenty hours, in order to do homage to their victim, and to avoid the maladies which his offended spirit might bring down upon the tribe.*

VIII.—NEWFOUNDLAND AND ITS BANKS.

The island of Newfoundland is a British colony distinct from the Dominion of Canada; when consulted by the confederate states, it declined to join the union as an integral part of the Dominion, and consequently continues to depend directly on the British Government. Nevertheless, annexation to Canada still remains an open question, which is the subject of continual discussion, in one form or another, in the periodical press and the deliberative assemblies. Account must also be taken of the common interests and close relations existing between the Maritime Provinces and Newfoundland. In fact, all these lands, apart from conventional divisions, are members of the same body politic, just as they belong to the same geographical region, despite the narrow passage by which they are separated. Hence it is convenient, after describing the provinces bordering on the St. Lawrence, to study the large island which stands out as a seaward bulwark of the vast estuary.

HISTORICAL RETROSPECT.

Of all American lands, Newfoundland has the least right to the name which it bears. It had already been discovered in the year 1000, or a few years later, either by Erik the Red, or by one of his sons, and from the Norse navigators it had received the name of Hellu-Land, or Mark-Land. Later, the memory of this discovery was preserved in tradition, and according to the Portuguese and Basque writers, there can be no doubt that the mariners of their nations had visited the banks and the islands of Newfoundland long before the first voyage of Columbus to the West Indies.

But however this be, the fifteenth century had not drawn to a close before Newfoundland was re-discovered by John Cabot, or Gaboto, possibly in the year 1494, when he sighted *Prima Vista*, but more probably in 1497, when he coasted the great island and the neighbouring continent. The rich fishing-grounds of these waters almost immediately attracted whole fleets in search of the fish required for the days of fasting and abstinence ordained by the Church. About the year 1580, there were annually assembled in this region from 350 to 400 vessels, of which 150 flew the French flag, 100 were Spanish, 50 Portuguese, 30 to 40 English, and 20 to 30 Basque.

Although relatively few in numbers, the English ships were the best equipped, and by the general accord of the fishers, the English captains were chosen as judges and arbitrators in the disputes that arose amongst the various members of

* J. Maclean, *Hudson Bay Territory*.

the floating commonwealth.* Such, at least, is the statement of the English writers. Anyhow, if this function of arbitrators was at first exercised by them by mutual consent, they soon claimed it as a right, and in the year 1583 Humphrey Gilbert took possession of the island in the name of the Queen of England. Thus Newfoundland, which at that time was supposed to form part of the mainland, is the oldest British colony.

The first essay at colonisation, however, was unsuccessful. Gilbert was accompanied by a party of 250 immigrants; but the new arrivals were soon discouraged by the lack of all resources except those derived from the fisheries. They refused obedience to the authorities, and despite the relentless severity of the governor, who cropped the ears of the malcontents, the colonists had all to be re-embarked and brought back to the mother country.

Gilbert's project was not resumed till the year 1608, when John Guyas, a Bristol navigator, established himself at Conception Bay, an inlet on the west side of the St. John's peninsula, but he soon removed the settlement to St. John's itself, the site of Gilbert's old colony. The rising town became the capital of the English possessions in Newfoundland, which in a few years embraced all the south-east coast of the island.

The numerous French names dotted over the map of Newfoundland attest the great influence exercised in the country by the rival nation, which long contested with England the possession of the Canadian lands. On various occasions they openly challenged the claims of the first occupants to the exclusive possession of the country. In 1635 they had secured the right of curing their fish on the coasts of Newfoundland on payment of a tax of 5 per cent., and in 1660 they even founded on a well-sheltered inlet of the south-east coast the village of Plaisance (Placentia), which became the headquarters of their fisheries. The settlement rapidly increased in importance especially after the year 1675, when the tax paid to England in recognition of her sovereign rights was finally abolished.

In 1694 a French expedition captured St. John's, but failed to drive the English out of the island. Fourteen years later a portion of the island fell again into the power of the French. But their rule was of short duration. In 1713 the treaty of Utrecht restored the whole of Newfoundland to the English, including even the town of Placentia, but at the same time leaving to their rivals the right of fishing in certain Newfoundland waters and of drying their captures on the west or "French" shore.

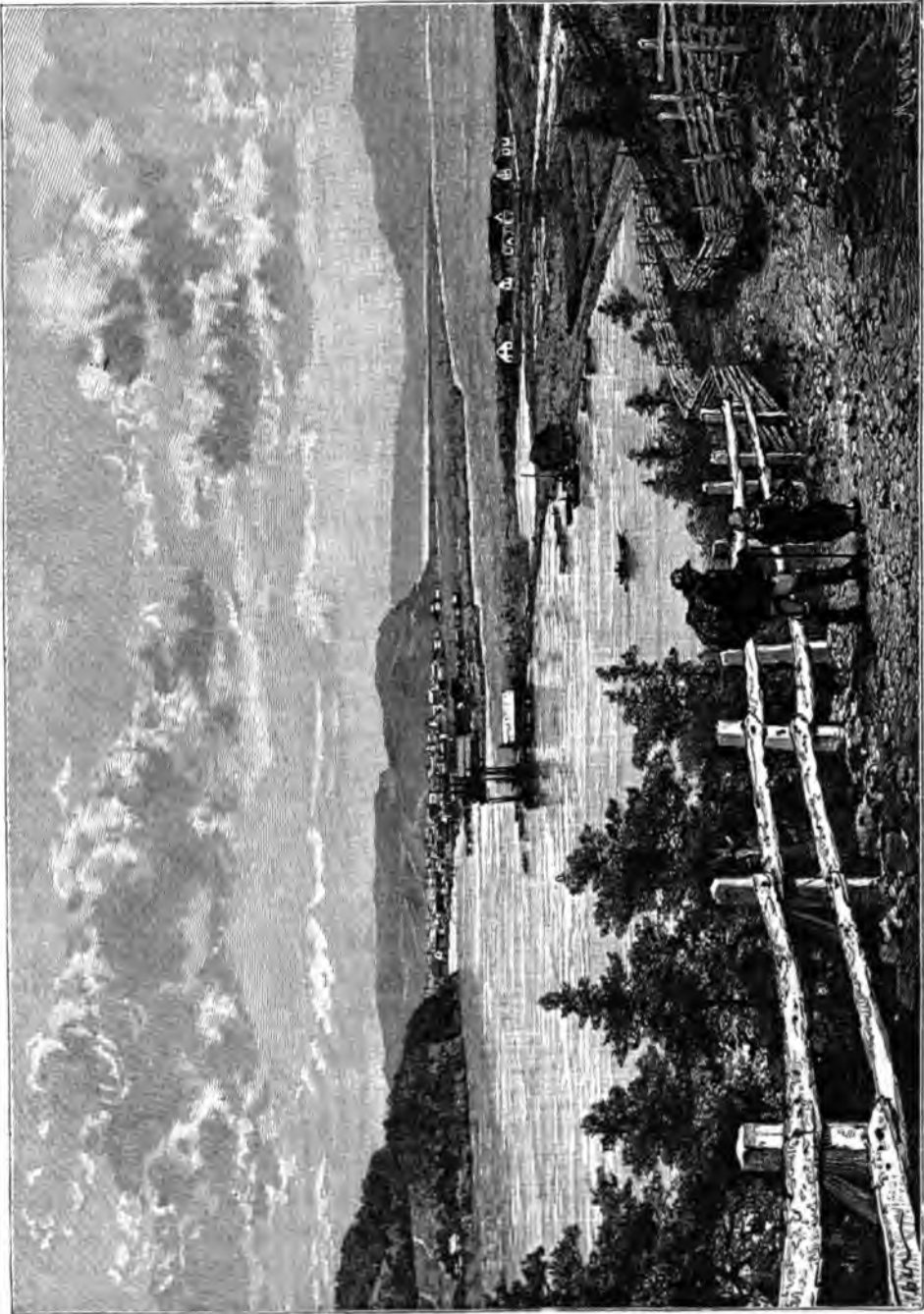
PHYSICAL FEATURES.

Although known for nine centuries, Newfoundland has remained till comparatively recent times completely unexplored in the interior. Nearly on all sides it presents to the sea a precipitous and forbidding seaboard. Few other coasts offer a more surprising succession of wild and romantic scenery—overhanging cliffs or terminating in sharp peaks, caverns and cavities where the noisy waters are

* Hakluyt; John Parkhurst.

engulfed, sloping ledges over which the waves expand in thin sheets, half-submerged reefs and blowers shrouded in white foam, projecting headlands fringed

Fig. 168.---PLACENTIA BAY, NEWFOUNDLAND.



with breakers, narrow gorges and chimes at the upper end of which may be seen the silvery threads of cascades.

In winter and spring the entrance of the harbours is blocked by ice, and they are often wrapped in dense fog. Even on land travelling is rendered almost impossible, except along the tracks made by the caribou, although in the interior there are no mountains of any great elevation; but the wayfarer is everywhere arrested by fjords penetrating far inland, by lakes and innumerable ponds and meres filling all the depressions. The tangled thickets of scrub present as great obstacles to progress as do the quagmires of saturated peat and mosses. In summer, the season of excursions, the air swarms with mosquitoes which settle in clouds on the wretched pedestrian and bathe his face in blood. Owing to all these obstacles and the generally rugged character of the surface, the interior long remained unexplored, and Newfoundland was for the first time crossed from shore to shore in the year 1822. The Exploits Valley, which intersects it obliquely from north-east to south-west, was also for the first time surveyed by the geologist, Murray, in 1861. Thanks to the new line of railway this valley will now afford more easy and rapid communication from one side to the other.

It is evident from its general outlines that Newfoundland consists of several ridges all disposed in the same direction, from south-south-west to north-north-east parallel with the mountain system of Gaspé Land. The western ridge, which skirts the east side of the Gulf of St. Lawrence, begins with the headland of Cape Ray at the south-west extremity of the island, and runs at a short distance from the coast, interrupted here and there by the bays and inlets which extend from the gulf some distance inland. Thus this main range, whose crests are of Laurentian formation while carboniferous rocks stretch along the seaward slope, is pierced by the deep fissures through which ramify the secondary fjords of St. George Bay. Farther on the range merges in a plateau ravined by long parallel faults, and again reappears with its carboniferous formation near White Bay on the north coast.

West of this range, main axis of the island, a ridge beginning at the escarpments of Cape Anguille, and rising at one point to a height of 1,900 feet, joins the main chain east of St. George Bay. Farther north another ridge, starting from Cape St. George, is interrupted by the Bay of Islands, beyond which it continues under the name of the Long Range to traverse the northern peninsula along the east side of Belle-Isle Strait. It has a total length of no less than 250 miles without counting the windings of its crest, and some of the peaks rise to a height of over 2,000 feet.

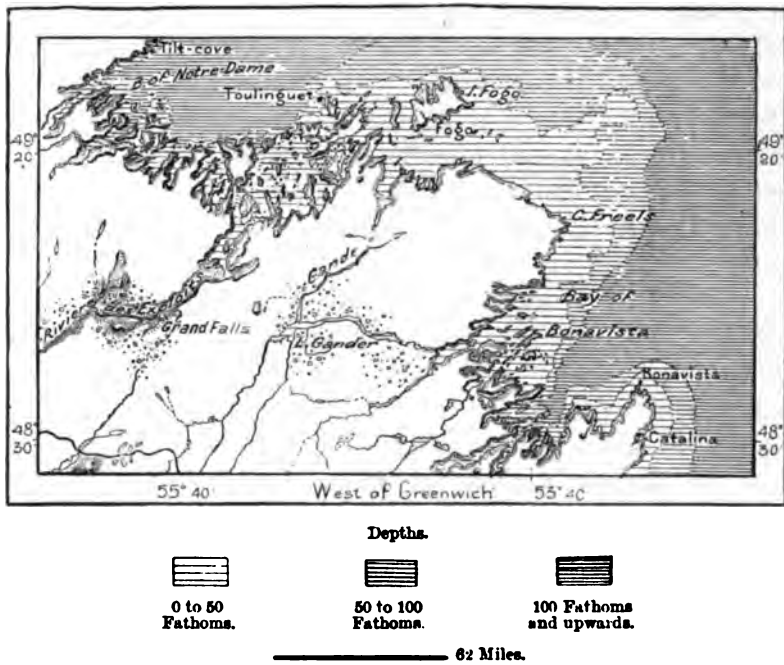
East of the main range other chains follow the same direction, terminating at both ends in promontories or peninsulas which in some places project far seawards. The Middle Range, above which rise a few serpentine masses, traverses the island obliquely south of the Exploits River and culminates in Mount Peyton (1,670 feet) near the north side. Another shorter and less elevated chain is developed between Placentia and Bonavista Bays, while the Avelon Peninsula in the extreme south-east consists of two parallel ridges nearly separated by the deep inlets of St. Mary's and Conception Bays.

Viewed as a whole, Newfoundland presents the form of an irregular triangular

plane inclined from south-west to north-east, the most elevated land occurring in the west and south, and thence sloping towards the Atlantic. Nevertheless the uniformity of this slope is broken by isolated eminences known by the name of *tolls*. The fluvial valleys occupy the depressions between the parallel ridges, which consist mainly of granitic masses, Laurentian or silurian rocks. Owing to the foldings and dislocations of these formations the island- and reef-studded marine inlets also penetrate far into the interior. Belle-Isle Strait itself is nothing more

Fig. 169.—THE GANDER FJORDS.

Scale 1 : 4,500,000.



than one of these valleys separating two parallel chains, those of Labrador on the north and of the Long Range on the south side.

RIVERS AND LAKES.

The Exploits River, largest fluvial basin in the island, with a total length of 200 miles, traverses the country diagonally from south-west to north-east, and the diagonal line is completed on the south side by the precipitous La Poile river, with its estuary of like name. A winding pond, flooding a granite basin at a height of 1,240 feet, is the source of the Exploits, which develops a series of similar basins in its descent from terrace to terrace of the plateau. After emerging from the long crescent-shaped Red Indian Lake, which about occupies the geographical centre of the island, and whose bed falls 500 feet below the marine surface, the Exploits enters the region of forests, chiefly pines, birches

poplars and aspens. Beyond this zone it descends seawards through a succession of rapids and cascades, one of which, the Grand Falls, has a drop of 145 feet. Farther down, the course of the river is again interrupted by another large cataract near the head of the rocky and island-studded inlet where it mingles its waters with those of the Atlantic.

All the other Newfoundland rivers resemble the Exploits in their salient features, lakes, cascades, and marine estuaries. The Gander, which flows in a valley parallel with the Exploits, and which falls into a bay not far to the east, is remarkable for the profound crevasses which form its bed, and which might be equally well described as lakes, rivers or fjords; at the narrowest point the chief fluvial gorge has a depth of over 330 feet.

The Humber, which traverses the western part of the island, discharging into the Bay of Islands, receives the overflow of the largest lake in Newfoundland, the Grand Pond, as it is called, which, like all the other lacustrine basins, is disposed in the direction from south-west to north-east. It covers an area of about 200 square miles, rather less than that of Lake Geneva; but, standing at an altitude of only 50 feet, its remarkably deep bed falls no less than 1,000 feet below the level of the sea.*

It has been estimated that the surface covered by the innumerable lakes, ponds and basins of all sorts dotted over the plateaux or disposed longitudinally with the river valleys, is equal to about one-third of the whole island. If to these be added the spongy expanse of the great bogs, more than half of Newfoundland may be said to be under water. In many places over a hundred flooded depressions may be counted by the observer standing on the summit of a single eminence. A lacustrine period has followed the glacial age, traces of which are observed on all the rocks. But at present no glaciers exist in Newfoundland. The hills are not sufficiently elevated for the snows to remain permanently on their summits and develop névés in their cirques. The winter snows everywhere disappear during the summer months.

The part of the coast most indented by fjords and inlets is the seaboard facing the Atlantic, and it was in this direction that flowed the old glacier which must have been several hundred yards thick. Through these inlets also penetrate the waters of the polar current setting from Baffin Bay and the northern straits; consequently here also is accumulated most of the drift-ice till the general break up in spring. Arrested by the headlands and broken into fragments, the icebergs continue to drift along the coasts in the direction of the south, and thus pass over the submarine banks which form a south-easterly and a southerly extension of Newfoundland.

THE BANK OF NEWFOUNDLAND.

These banks, far more extensive than Newfoundland itself, do not present any indented contour lines like the shores of that island. On the contrary the Great Bank of Newfoundland, disposed in the form of a curvilinear triangle, everywhere

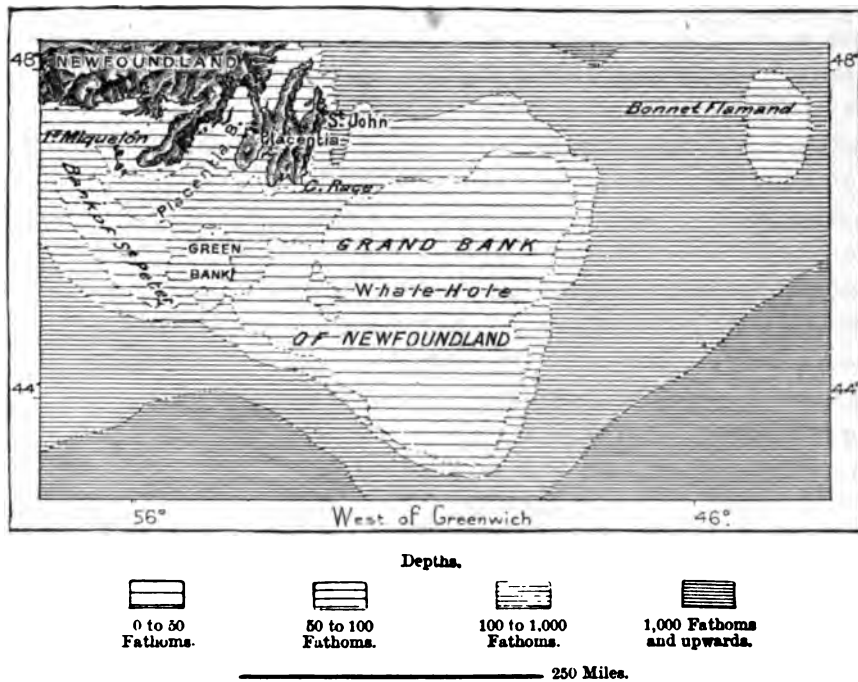
* *Proceedings and Transactions of the R. Society of Canada*, 1882-3.

presents rounded outlines with long curved inflexions. Were the whole marine bed upheaved it would attach itself as a heavy peninsular mass to North America.

Taken in its widest sense, the Bank of Newfoundland, that is, the submarine space covered by water less than 50 fathoms deep, occupies off the island a superficial area of about 48,000 or 50,000 square miles. Its bed presents but slight undulations, and those engaged in probing its depths may in many places traverse vast distances without detecting a difference of more than three or four feet in the liquid layers. Nevertheless, a few cavities occur in the sands of its bed. Such is the "Whale Hole," caused perhaps by the eddies of the conflicting

Fig. 170.—BANK OF NEWFOUNDLAND.

Scale 1 : 10,000,000.



currents in the western part of the bank south of Cape Race, and sinking to a depth of nearly 400 feet. An equally profound chasm limits the bank on the north-west, separating it from the Avalon Peninsula and from the less extensive and shallower submarine islets called the Banc à Vert, and the Banc de Sainte Pierre from the French island of that name.

In the extreme east, and at a distance of about 125 miles, another bank, the so-called Bonnet-Flamand, rises in an oval mass above the surrounding abysses which have an average depth of about 500 fathoms. It is precisely in the vicinity of these elevated plateaux that the ocean bed itself plunges into the deepest chasm yet revealed in the whole of the Atlantic.

The seas break over the Newfoundland banks although they are covered by 35 or 40 fathoms of water. Hence their approach is usually revealed to mariners by the heavy chopping waves fringing their borders. But within this fringe of agitated waters the sea is generally calm, so that the bank itself might be regarded as forming a veritable harbour of refuge but for the risk of collision with the fishing smacks, steamers, or icebergs, a risk which is never absent from these waters during the fishing season. The large Atlantic liners, the most dreaded in case of collision, owing to their speed and enormous size, pass regularly over the southern "tail" of the bank, thereby prolonging their passage by three or four hours, but at the same time avoiding numerous disasters. No international convention, however, has yet been signed, by which the highway of ocean traffic might be deflected altogether from these banks, at least during the fishing season. The long convoys of icebergs drifting with the polar current would still remain a constant source of danger, to be guarded against by the experience, skill, and presence of mind of the mariners navigating these waters. The skipper has to study from a distance the aspect of the surface, the glint of the crystal masses reflected from the clouds, the dense fogs and clear skies. He must take note in the waters themselves of the changes of temperature, of colour, and of animal life caused by the proximity or remoteness of the floating masses. And when the seas are wrapped in impenetrable mist, deadening the senses and concealing all objects however near, he must be ready for every contingency, unhesitatingly cutting moorings and fishing gear alike adrift, should the roar of the breakers, at times even the crackling and shrinking of the huge ice-hills, or else the sudden lowering of the temperature warn him of the imminent peril.

These convoys, drifting down from the higher latitudes, pass for the most part along the eastern section of the bank, a few straggling blocks alone being attracted to the neighbourhood of the Newfoundland coasts. Their route is, in fact, largely determined by the action of the Gulf Stream, which sets in the direction from south-west to north-east, thus deflecting the convoys from their normal course and driving them more to the east. But independently of this cause, their line of march is constantly modified by the bulk of the masses themselves, as well as by the conflict of the marine currents which collide in these waters, and become divided into secondary streams either flowing side by side or superimposed one above the other and moving in opposite directions.

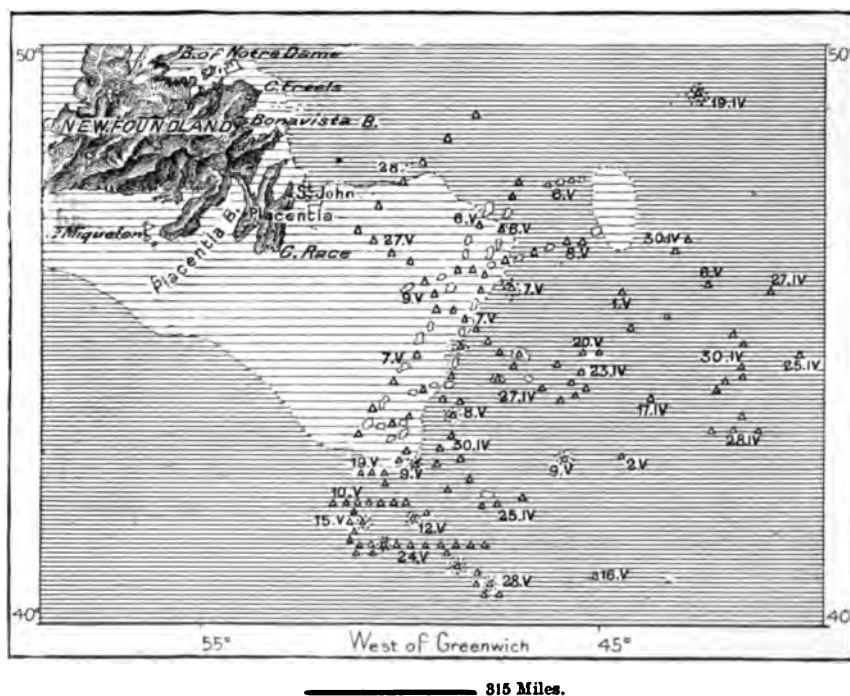
Wherever the iceberg is entirely confined to the polar current, it progresses with the same velocity as the current itself; but when brought within the influence of the warmer stream from the tropical seas, it is not only turned eastwards but also begins to crack and thaw, rapidly shifting its centre of gravity and now and then toppling over with a great crash. Usually, however, it is impelled successively or even simultaneously by opposing forces; the under current contends with the upper, and the block, penetrating through both layers, hesitates, oscillates, swings round or moves backwards and forwards without any apparent reason. Between 46° and 44° north latitude the convoys usually begin to break up, before finally disappearing altogether in the tepid waters of the Gulf Stream. Their

presence, size, numbers and general bearing are signalled by passing vessels and semaphores to Washington and thence communicated to all the ports along the eastern seaboard.

The hypothesis has long been advanced that the Newfoundland and neighbouring banks have been formed by the débris of all kinds deposited by the melting icebergs in the region where converge the two opposing currents from Baffin Bay and the Gulf of Mexico. Nevertheless the careful observations taken in this very region have shown that in the North Atlantic the polar drift-ice contains but a very small quantity of the rocks and stony fragments and glacial clays either brought down with the glaciers from the rocky slopes of Greenland,

Fig. 171.—ICEBERGS OFF NEWFOUNDLAND.

Scale 1 : 21,000,000.



or else carried away from the bed of the lower gorges. All the blocks that get stranded on the Newfoundland coast are found to be pure as crystal, and singularly free from sedimentary matter. Hence they can have contributed to a scarcely appreciable extent to the gradual building up of the submarine beds stretching south-eastwards from the great island.*

Moreover, the marine regions where the convoys are concentrated in the largest number by no means correspond in their general contours with those of the submerged plateaux, while the banks stretching due south from Newfoundland lie altogether beyond, that is, considerably to the west, of the route followed by the

* Thoulet, *Bulletin de Géographie historique et descriptive*, Nancy, 1887, No. 1.

convoys. The now flooded banks must therefore be regarded as belonging to the primitive features of the terrestrial crust. They form part of the pedestal on which the American continent itself reposes. At the same time it is remarkable that the plummet never strikes a hard rocky bed, and that all the débris fished up during the soundings contain nothing but sands and gravels intermingled with shells.

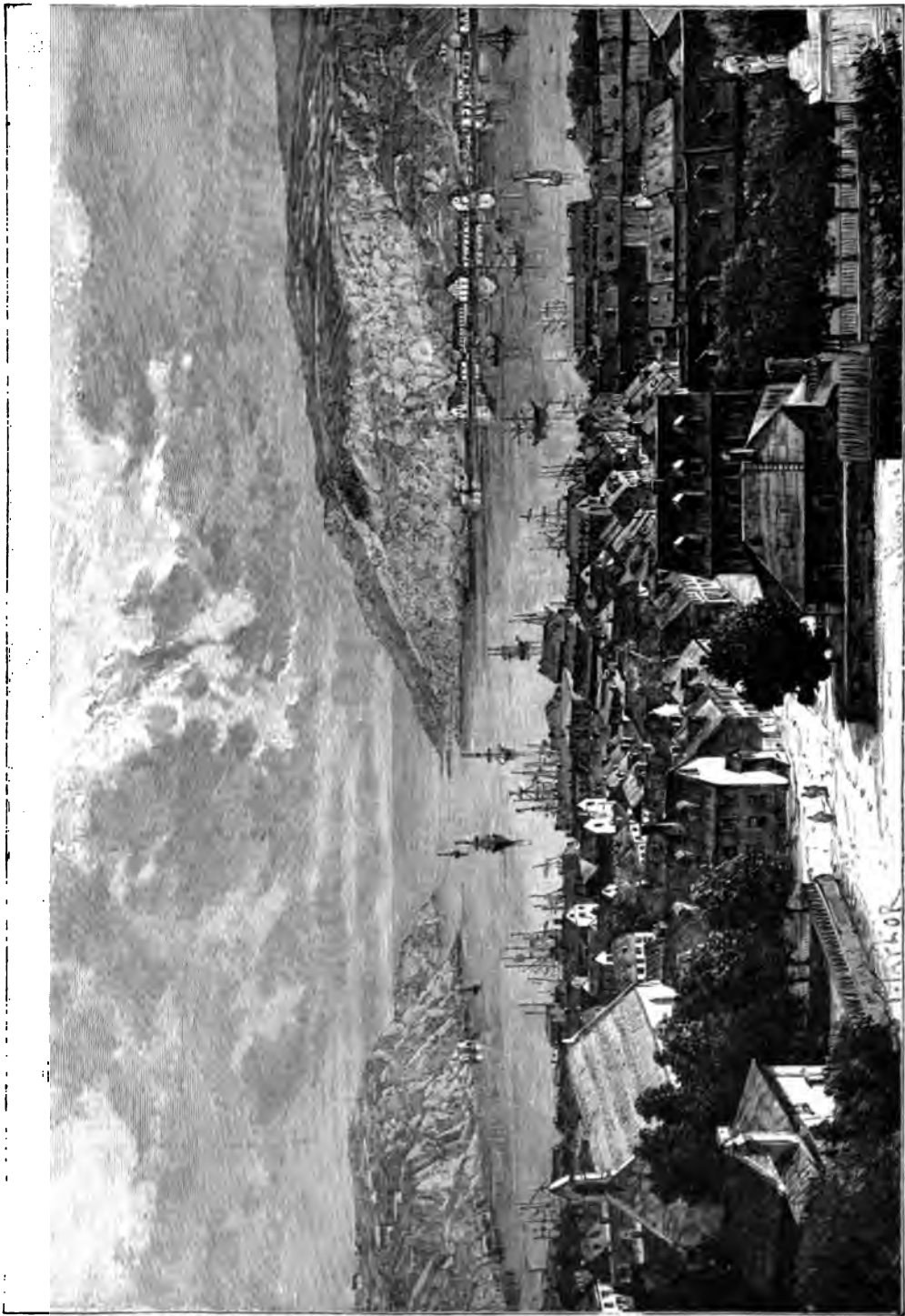
CLIMATE.

But if the clash of the conflicting currents has played but an insignificant part in modifying the marine bed, it is certainly the chief cause of the vapours which are so characteristic of the eastern waters of Newfoundland. During the spring, summer and autumn months, when the Gulf Stream prevails in this region, the mists roll up in abundance from the surface of the suddenly-chilled waters, and the surrounding seas become enveloped in fogs covering a space as large as France or even as half the European continent. The reports of seafarers, for the most part familiar only with the south-eastern ports and approaches of Newfoundland, tend to confuse the island itself with its banks; hence dense fogs are commonly regarded as a normal if not permanent feature of its climate. Doubtless during the prevalence of the south and south-east winds the vapours are rolled up from the banks by the atmospheric currents, and at such times they are spread in thick masses over the creeks and inlets along the south coast. But as a rule they seldom penetrate far into the interior, and, according to the local saying, "The land eats the fog."

The coasts most frequently wrapped in mist are precisely the most densely peopled, lying as they do over against the banks and their fisheries, that is, the chief resource of the islanders. On the west side turned towards the Gulf of St. Lawrence, fogs are rarely seen. Even in the north-east as far as Bonavista Bay thick vapours are scarcely developed, for the tepid waters of the Gulf Stream are prevented by the long south-eastern peninsula from penetrating into these inlets. During the greater part of the year the dominant winds are those from the west and south-west, which blow parallel with the oceanic currents, and these winds, instead of driving the vapours towards Newfoundland, waft them across the Atlantic in the direction of West Europe. The fogs generated in the Newfoundland seas are thus largely absorbed, especially by the British Isles.

The climate of Newfoundland, which on the whole is much colder than that of West Europe, occupies a somewhat intermediate position between a strictly continental and a marine climate.* Newfoundland is, no doubt, an insular region, but the prevailing winds are those which blow from the neighbouring continent. The aspect of its seaboard forms one of the chief elements in determining its normal temperature. Thus St. George Bay, broadening out in the direction of the south-west, is exposed to the full force of the aerial currents blowing across the Gulf of St. Lawrence from that quarter, while it is protected from the northern gales by the barrier of the highest eminences in the island. Hence St. George

* Mean temperature of St. John's, 41° F.; of Brest (Brittany), 54° F.; difference, 13° F.



GENERAL VIEW OF ST. JOHN'S, NEWFOUNDLAND.



Bay enjoys a higher mean temperature and a more equable succession of seasons than the inlet of St. John's, which, although lying more to the south and frequently enveloped in the marine vapours, is exposed to the cold northern winds and washed by waters chilled by the melting of the icebergs.*

In the southern parts of the island the rainfall is abundant, the yearly average exceeding 60 inches, or nearly double the quantity precipitated in France. During the winter months, this moisture nearly always assumes the form of snow, either soft and flaky or sharp as needles, and at times, especially during the prevalence of the north-westerly gales, the squalls sweep down with such violence that the boldest pedestrians scarcely venture to leave the shelter of their homes. But storms, properly so called, are rare, and whole years sometimes pass without a single peal of thunder being heard. As in Canada, but much more generally, the branches of the trees, the shrubs and hedges, are covered in winter with a "silvery dew" formed by the cold rains suddenly freezing at contact with solid bodies.

FLORA.

In its flora Newfoundland also resembles Canada, except that it lacks numerous species, such as the cedar, beech, elm and oak, while others, stunted by the winds, are of much smaller size. On the east side of the island the prevalence of fogs prevents such European fruits as the apple, pear and plum from ripening, and the inland districts are still too thinly peopled to introduce horticulture. But there is a great abundance of berry-bearing plants, Newfoundland in this respect resembling the north-western regions of the Dominion. For thousands of square miles the rocks and swamps are overgrown with low bushes which yield large quantities of berries, chiefly used in the preparation of jams and preserves. From a variety of thorn is extracted a kind of beer, the common beverage of the Newfoundlanders.

FAUNA.

Like its flora, the Newfoundland fauna resembles that of Canada with the difference that it comprises a much smaller number of species. Thus not a single venomous snake is found in the island, which also lacks frogs and toads. On the other hand it occasionally receives guests not met in Canada. Such are the polar bear and the walrus, which are brought by the icebergs and landed on the Newfoundland coasts at a season when in European regions under the same latitude nature is bursting into new life. The difficulty of hunting over such rough ground has protected the caribou, which still wanders over

* Meteorological conditions of Newfoundland and St. Pierre on the south-west and south-east coasts :—

	Latitude.	Mean Temp	Extremes		Rainfall.
			of Heat.	of Cold.	
St. John's (8 years)	47° 34'	41° F.	88° F.	3° F.	80 inches.
St. George	48° 25'	43°	(?)	15°	(?)
St. Pierre	46° 47'	42°	74°	—4°	27 inches.

the interior in considerable herds, browsing in summer on the lichens of the northern peninsula, and returning in winter to the southern thickets. Here the enemy of the caribou is not man but the wolf, who commits terrible depredations amongst the herds.

The fine race of "Newfoundland dogs," known all the world over, has almost disappeared. At present the most valued breed is derived from crossings between the Leonberg and Pyrenees hounds of allied species.

Of all the American islands one of the richest in aquatic birds is the little cluster of rocks known as Funk's Island, which lies off the east coast in the vicinity of the banks, and which is supposed to be identical with Jacques Cartier's "île des oiseaux," where the auk (*alca impennis*) formerly gathered in prodigious multitudes. But it was pursued with such relentless eagerness that the whole race was speedily exterminated. Towards the end of the last century it had already disappeared from all the American waters, where it had been met by the early explorers. Of the seventy-two skeletons of the great auk preserved in our museums three came from Funk's Island.

Other aquatic fowl, whose great power of flight enabled them to escape from wholesale massacre, still abound on all the rocky headlands and inlets round the coast. They are familiarly known by the comical names of *turrs* and *murrs*.

Except in some of the inlets the amazing abundance of fish in the Newfoundland seas appears to have suffered no diminution. Newfoundland is still pre-eminently the "Land of Cod," or the "Terre des Molues," whose name figures on the old maps. The designation *baccalaos*, applied at a still earlier date to the same species by the Flemish, Spanish, and Portuguese fishermen, still survives on the little Bacalieu Island off the east coast.

The cod is always accompanied by numerous associates, and the sea teems with various organisms which serve as food for the larger species. One of the forms discovered in the Gulf of St. Lawrence may be called the "angler" in a pre-eminent sense; to its head is attached an elongated appendage or filament which is dangled about like bait, and then sweeps the prey into the angler's mouth. Huge octopuses abound in these seas; in 1873 one was captured whose body, 7 feet 6 inches long, was provided with ten arms with over a thousand suckers, and measuring 52 feet from one extremity to the other of the tentacles. Since then fragments of squids, even of larger dimensions, have been found cast up on the beach after stormy weather.

INHABITANTS OF NEWFOUNDLAND.—THE BEOTHUKS.

The Beothuks, as the aborigines were called, have been exterminated; nothing has been preserved of the race except a solitary skull now in the St. John's Museum, a short vocabulary of their language, and a few of their stone implements. At the first arrival of the whites this tribe of Algonquins were still numerous, although Champlain believed Newfoundland to have been uninhabited. The Beothuks gave a friendly welcome to the strangers, who with their hunting

instincts repaid them by regarding the natives as only another species of game. The Mic-Macs of the mainland, hereditary foes of the Beothuks, also profited by the relative superiority which they derived from the firearms introduced by the Europeans. Armed with these weapons they often crossed the strait to destroy the camping-grounds in the vicinity of the south coast.

At the beginning of the present century there survived only a small number of these Indians, who had taken refuge in the more inaccessible regions of the interior, where they were surrounded by swamps and lakes. In its essays at "civilisation" the Government offered rewards for the capture of the natives, and thus were secured a few women, who, however, failed to appreciate the benevolent motives of their captors. The last of such captures were made in the year 1823, after which time no one pretends to have seen a Beothuk in any part of the island. Possibly a small band of fugitives may have succeeded in crossing Belle-Isle Strait to the mainland, though it is difficult to believe that such an event could have taken place without coming to the knowledge of any of the white, Indian, or Eskimo inhabitants of Labrador. The race had already been destroyed by the gun of the trappers, by famine, disease, and misery, when in 1828 there was founded at St. John's a "Beothuk Society," whose professed object was to come to the aid of the ill-fated fugitives. But they found none to succour, and the few Indian families now met in Newfoundland are Mic-Mac immigrants from the mainland.

THE WHITES.

The white population is of mixed origin. To judge from the names of localities one might suppose that French was the language of the majority; but such is far from being the case, these names being given by the people engaged in the cod-fisheries, who do not remain in the country or form any permanent settlements. Hence the geographical nomenclature gives no certain indications, although the French element must enter largely into the constitution of the people. They are in exclusive possession of the two islands of St. Pierre and Miquelon, which belong politically to France; they are also numerous on the neighbouring coast, as well as in the Avelon Peninsula, the part of the island which is most densely peopled; on St. George Bay, where some Acadians are intermingled with the British populations; lastly, on the "French" or west shore, where they reside temporarily during the fishing and curing season.

But their actual numbers are not even approximately given by any statistical returns. Towards the middle of the present century M. Rameau estimated them at from 15,000 to 20,000 in a total population of 130,000. In the official documents all the inhabitants of the island pass for English whatever be their mother country. The Irish are very numerous, so that the Roman Catholic Church has more adherents than any single Protestant sect, although all the Protestants taken collectively exceed the Romanists by nearly 50,000, the respective numbers being 122,000 and 74,000 in the year 1886.

COLONISATION.

To the commercial monopolies must be laid the blame of the slow progress made in the colonisation of Newfoundland. Every year the "admirals" of the fisheries assumed the command of the island which was governed as if it were a man-of-war. The first care of the admirals was to destroy all the houses, huts, or sheds which had been erected near the coast, for the beach was regarded in its entire length as a sort of military zone, like the land in the vicinity of citadels or fortresses. On their return from the fisheries the captains had to bring back all the men embarked in England, or else account for their death; they were strictly charged not to leave behind them a single emigrant.

No stranger could settle in the country, acquire any land in freehold, or build the smallest house without the express permission of the governor; such permission was seldom granted, because the fishing and agricultural interests were supposed to be antagonistic, and the latter had to be sacrificed to the former. The colonists in fact appeared in the light of mere intruders, marauders prowling about the fisheries, watching for an opportunity of snapping up a few yards of the beach or some vantage-ground about the landing-places. So late as the year 1797 a governor gave one of the magistrates a tremendous wiggling for having allowed somebody to enclose a bit of land. Moreover, the rampant intolerance forbade the exercise of the Roman Catholic religion, and the "Irishry" were often re-shipped by whole cargoes for their distressful country. The celebration of Mass was regarded as a felony, and to secure a passage across the Atlantic the priests had to disguise themselves as common sailors. When thinking people ponder over these things they are set a-wondering how the Anglo-Saxon race ever struggled to the front at all. They forget that all things are relative in this world, and that if the British colonial policy was bad, the French and the Spanish were also bad, in some respects ten times worse.

Despite all the measures taken to prevent the colony from flourishing, its population at the beginning of the present century had already risen to some 20,000 permanent settlers. At that time all Europe was at war; the foreign fishing-fleets were blockaded by British cruisers in their ports, and the Newfoundland fisheries acquired quite an exceptional importance. The population of the island increased rapidly, rising to 70,000 at the conclusion of the Napoleonic wars in 1815.

But then came a general commercial smash, and the people who had depended exclusively on the fisheries suddenly found themselves without work and exposed to the danger of perishing of hunger. The situation became so critical that it was proposed to remove most of the inhabitants elsewhere, and steps were even taken to carry out the project. A few hundred of the more indigent Irish were sent back to increase the misery of their native land, and over a thousand persons emigrated to Nova Scotia.

Nevertheless, the economic situation gradually returned to the normal conditions, and the population continued to increase chiefly by the excess of births over

the mortality. At present it exceeds 200,000, and the equilibrium already about restored between the sexes shows that immigration has contributed but a small share to the growth of the population. Newfoundland is on the whole an extremely healthy region, and its most dreaded ailments are all forms of rheumatism and chest diseases, such as might be expected to prevail in a damp, foggy climate.

AGRICULTURAL PROSPECTS.

Agriculture still remains in a rudimentary state, and the whole extent of land under tillage is only about 55,000 acres, or, say, one-seventieth part of the surface. Recently the agricultural prospects of the island have been the subject of some warm discussion in connection with certain railway projects to be carried out by

Fig. 172.—CHIEF CENTRES OF FRENCH POPULATION IN THE DOMINION.

Scale 1 : 46,000,000.



the aid of British capital. On this point Major-General Dashwood, speaking from a knowledge of the island extending over nineteen years, remarks that districts described on railway maps as rich soil, are nothing but "bogs, rocks, and scrubs." He observes generally that the greater part of the land is of a poor stony nature, needing much manure, for which fish and seaweed are used on the coastlands. Some isolated bottom lands may be described as fairly good, but the summer heat, combined with late springs and early autumns, is so uncertain that cereals cannot be grown to advantage, though good root crops may be raised. Hay is seldom a good crop, unless in a very wet summer. This makes it all the more difficult to rear any number of stock, when it must be remembered that they must be kept up about half the year. There is very little natural herbage in this island on which stock can feed, though cattle will browse in the woods in summer; and there is hardly any "interval" land, that is, meadows flooded by rivers; add to which there is no market except St. John's for farming produce, that is to say, the dealers in the out harbours will pay in cash for hardly anything except fur,

the truck system being in force everywhere, except for articles sold in the town of St. John's.*

THE FISHERIES.

On the other hand the industries, properly so called, are acquiring more importance in the general economy of the island. Nevertheless the fisheries still remain its chief resource. Cod continues to be "the soul of the colony." The annual exportation consists almost exclusively of the various products of the fishing-grounds—cod and cod-liver oil, herrings, salmon, trout, seal-skins, and blubber. To these Newfoundland exports must be added those of the two French islands of Saint-Pierre and Miquelon, derived entirely from the vast vivarium of the banks and representing a yearly value of about £600,000. Account should also be taken of the enormous local consumption and of the manufacture of manures, in which are chiefly used the heads of the cod-fish rejected by the curers. Despite the annual catch, which rises at times to 150 and even 175 millions, there does not appear to be any appreciable diminution of the shoals,† although some of the inlets, amongst others that of Conception Bay west of St. John's, have become comparatively deserted.

These treasures are shared by three nations, the English, the French, and the Americans. Although the political rulers of the island, the English fishers are not in a majority, while the Newfoundlanders themselves confine their attention almost entirely to the coasts of the island and of Labrador. The Americans, to whom the treaties give the right of fishing to within three geographical miles of the shore, fish on the banks; but the distance thence to the Maine and Massachusetts curing-grounds is still considerable.

The French, who have for four hundred years supplied the markets of West Europe and the Mediterranean, enjoy still more extensive privileges in virtue of the treaty of Utrecht, concluded in 1713, and frequently confirmed since that time. They have the special advantage of a solid base of operations secured by the absolute possession of the two islands of Saint-Pierre and Miquelon, besides the right of using the "French Shore," that is, the west coast of Newfoundland, for curing purposes. They have the right of fishing in these waters, and of erecting sheds and platforms on the beach, but not of building permanent structures or passing the winter on the mainland.

INTERNATIONAL CONFLICTS.

It is easy to understand how the clash of interests gives rise to frequent conflicts on this territory belonging as it were to two rival masters. Hence the incessant diplomatic wranglings, which have at times assumed a threatening aspect. The bounties of from ten to sixteen shillings for every hundredweight of fish, and of twenty shillings for every man employed, which the French Government grants to the owners of the fishing-smacks with a view "to protect acquired

* *Proceedings of the Royal Geographical Society*, 1888, p. 632.

† E. B. Biggar, *op. cit.*

interests," and to form recruits for the navy, are regarded by the Newfoundland and Canadian legislatures as an infringement of the conditions, preventing their own fishers from competing on equal terms with the French.

In order to neutralise the effect of the French bounties the Newfoundland legislature passed a law in 1886, sanctioned by the British Government in 1888, which prohibits the export to Saint-Pierre and Miquelon of the bait required by the French fishers. At the beginning of the season capelan is the best for this purpose, followed during the months of August and September by a small species of octopus, and towards the close of the season by the herring. At the risk of completely ruining the populations of Fortune and Placentia Bays, who formerly supplied these different kinds of bait to the French, the St. John's legislature has interdicted their capture.

According to the new regulations for the sale of bait (April, 1890) it is provided that all French, American, and Canadian fishing vessels shall pay the ordinary light dues, and four shillings per ton as licence fee for every time she enters port for the purchase of bait. The purchase itself is limited to one barrel per ton register, and a second licence will not be granted within three weeks of the date of the first.

The French were little troubled by the embargo laid upon the capelan, because from the 12th till the 15th of June this species swarms in the inlets of Saint-Pierre and Miquelon in such prodigious quantities that it imparts a milky colour to the surrounding waters, and the capelans are sometimes heaped 12 or 16 inches thick along the beach. Some of the other bait was also procured by smuggling, though of course at increased expense for the fishers. Recourse has also been had to other expedients to keep up the supply, and improved kinds of fishing-gear have even been introduced wherewith to capture the cod by new processes. Lastly, a large number of fishers have abandoned the banks, and have begun to work the lobster-grounds on the French Shore, or applied themselves to the preparation of preserved food. The rival parties indulge in mutual recrimination, and accuse each other of laying snares at the entrance of the inlets to capture whole shoals, and thus depopulate the grounds. The Canadian Government, on its part, which had hitherto observed a certain neutrality in the conflict, has now taken sides with Newfoundland against France by prohibiting the French fishers from passing their cargoes of fish free of charge through the port of Halifax.

Lately this state of suppressed warfare brought about the temporary overthrow of the Newfoundland ministry, which had prohibited the sale of bait, and the negotiations carried on between the British and French Governments resulted in a sort of *modus vivendi*, which might afford time for a permanent settlement of the dispute. It was hoped that this temporary arrangement would give general satisfaction, especially as it has been proposed to repeal the Bait Act, replacing it by a provision for the purchase of bait by fishermen of all nationalities upon payment of licence and tonnage fees. But the *modus vivendi* is now generally condemned by public opinion in Newfoundland, and a demand has been made for

the total abolition of the old treaties, and for the extinction of all French maritime and territorial rights in the colony.

This result has already been virtually brought about on the French Shore, where the very force of circumstances has rendered impracticable the old treaty, which, in fact, has been officially violated since the year 1881. Numerous groups of British colonists have settled on this interdicted coast, and to them the French fishermen usually entrust the care of their establishments during the winter months. The legal existence of these colonies, which already comprise over 12,000 residents, has been recognised by the British Government, and the "French Shore," hitherto a sort of neutral ground where no one had the right to settle, has become an "English Shore." The French fishers, injured by these inevitable changes, have preserved their fishing rights alone.

OTHER FISHERIES—NAVIGATION.

Next to cod, the herring has the greatest economic value on these fishing-grounds. It is taken especially in the bay of Islands and in the Humber arm, that is, that branch of the bay where the Humber reaches the coast. Even in winter the herring is pursued in the Eskimo fashion by piercing the ice, and casting the nets into the hidden waters.

On the other hand, both the salmon and seal fisheries have gradually fallen off, and no longer possess any importance in the general trade of the colony. The number of seals taken on the Newfoundland coasts fell from nearly 687,000 in 1831 to a little over 200,000 in 1882. The oyster-beds have also been almost completely exhausted. But on various points on the coast, and especially at Dildo Island in Trinity Bay, piscicultural establishments have been founded with such results that some hope is now entertained of the waters being re-stocked which had been depopulated by the reckless improvidence of the former fishers. Hundreds of millions of cod and lobster fry are periodically distributed by these breeding-stations.

General navigation, apart from the fisheries, is in a fairly flourishing state, but in the statistical returns account is taken only of those vessels which regularly visit the Newfoundland seaports to land or ship freight. The local mercantile fleet, consisting almost exclusively of fishing craft, comprises over 2,000 vessels of all sorts, of about 100,000 tons burden. Thus the smacks do not average more than 50 tons, and are mainly confined to the Gulf of St. Lawrence, the banks, and the Labrador coasts. At first sight, Newfoundland would seem to be admirably situated for developing a great shipping movement, projecting, as it does, far seawards in the direction of Europe. The transatlantic passage would even be reduced by two days were St. John's selected as the terminus on the American side. But the railway intended for the transport of passengers and merchandise across the island is not yet terminated, and most travellers who brave the seas will probably prefer the longer voyage to the inconvenience of two embarkations

followed by a considerable railway journey to reach such centres as New York and Montreal.

However Newfoundland must always remain the most advanced terminus of the international telegraph service on the American side. Of the ten North Atlantic submarine cables five are landed at Heart's Content on the east side of Trinity Bay, while other cables radiate from the island in the direction of Canada, Cape Breton, Nova Scotia, and the United States.

MINERAL RESOURCES.

Newfoundland is known to possess a considerable reserve of mineral wealth, which however must remain to a large extent undeveloped until the country is opened up by a more extended system of railway communication. The copper mines, which have been partly worked, are noted for the excellent quality of their ores. Several thousand tons of these ores are now annually exported, and recent surveys show that the country abounds in other minerals, such as iron, magnetic iron, sulphur, coal, graphite, nickel, lead and sulphur. Extensive deposits of magnetic iron ore, from which the finest steel can be made, were discovered in the year 1888 in the neighbourhood of the St. George Bay coal fields, a district which also presents the advantage of much wooded and fertile land.

The Newfoundland sulphur deposits yield considerably over fifty-one per cent. of pure sulphur, which is two per cent. more than the richest beds in Sicily and other parts of Europe. At the Little Bay copper mines smelting furnaces were erected in the year 1889, for the purpose of smelting the ore on the spot, and exporting the copper in its pure state. Extensive mining operations have also been recently undertaken by a Scotch company, which has purchased several lead and silver mines in the Placentia Bay district.

TOPOGRAPHY OF NEWFOUNDLAND.

St. John's, not *St. John*, which is the name of the New Brunswick seaport, is the capital and largest town in Newfoundland, one-sixth part of the whole population being centred in the place. It dates from the earliest times of the discovery by Basques, Bretons, and Portuguese, and was already much frequented by fishing craft so early as the beginning of the sixteenth century. Hence the possession of this port was hotly contested by the English and French, but it has belonged to England for nearly two hundred years. The town is invisible from the sea, and the entrance to the harbour is indicated by beacons erected on the summits of the headlands. On rounding one of these promontories, navigators enter the Narrows, a marine channel about a third of a mile long, which is dominated by bluffs 500 or 600 feet high, and which was formerly closed against hostile vessels by an iron chain 220 yards long. On one occasion the passage was

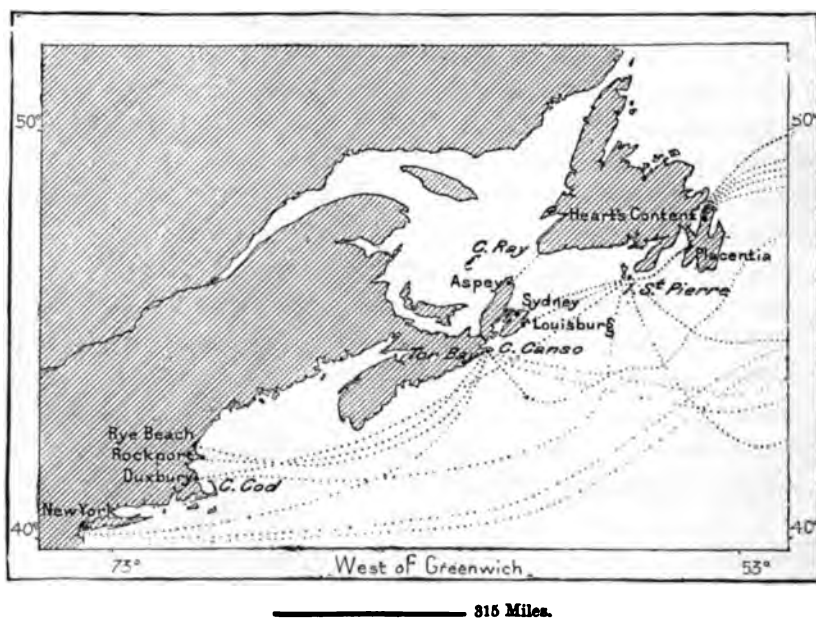
so completely blocked by masses of ice driving before the storm that the obstruction had to be removed by blasting with gunpowder.

The Narrows suddenly expand into a spacious basin of smooth water, on the north side of which the city is seen rising in amphitheatrical form on the terraced slopes of the hills. But despite its picturesque position, St. John's cannot be called a fine town. It was mainly built by traders and shippers, few of whom had the intention of permanently settling in the place; hence they were satisfied with temporary residences and with tasteless warehouses solid enough to shelter their stores. The poorer classes, mostly of Irish descent, live in grimy wooden houses affording fuel to the flames of the frequent winter fires.

All quarters are pervaded by the penetrating smell of fish, which is quite

Fig. 173.—CHIEF ATLANTIC CABLES TERMINATING AT NEWFOUNDLAND.

Scale 1 : 19,000,000



intolerable on the beach where the curing-sheds are erected. A town whose atmosphere is permanently charged with such odours scarcely lends itself to architectural display; fortunately, however, it is abundantly supplied with pure water derived from a lake in the neighbouring hills. A few gardeners have also succeeded in raising a scanty crop of vegetables from the poor soil covering the surrounding rocks.

A railway which rounds Conception Bay, so named by Cortereal, connects St. John's with *Harbour-Grace* (originally *Harre-de-Grâce*), the second largest place in the island. Its houses are grouped together on the shores of a creek which is sheltered from the surf by a tongue of sand, and which, in the sixteenth century, was often crowded with as many as four hundred English, French, and Portuguese fishing-smacks. Although the waters of Conception Bay no longer teem to the

same extent as formerly in animal life, Harbour-Grace is still much frequented during the fishing season.

On an inlet of the same bay about eight miles farther north stands the English town of *Carbonear*, on the site of the old French settlement of *Carbonière*, also a busy seaport during the season. On the east side of Trinity Bay, north-west from Carbonear, lies the pleasant little fishing village of *Heart's Content*, memorable as the spot where was landed the electric cable of 1858, by which submarine communication was first established between the Old and New World. From the "words of good will" on that occasion flashed across the ocean and transmitted to the ends of the earth, one might have supposed that the era of universal brotherhood had at last begun.

Other fishing stations follow north of Conception and Trinity Bays, and here the towns of *Catalina* and *Bonavista*, dating from the first years of the discovery, still receive hundreds of fishing craft. The harbour of *Greenspond* is also much frequented, and beyond the neighbouring headland of Cape Freels (*Fréhel*) are situated two other ports, those of *Fogo* and the old French town of *Toulinguet*, which the English have transformed to *Twillingate*. This place stands on two rocky islets connected by a picturesque viaduct. From this district were, till recently, procured the finest Newfoundland dogs, perfectly black with a white cross on the breast.

These ports on the north coast equip a considerable number of smacks for the Labrador fisheries. Here also some agriculture is carried on, especially in the vicinity of Twillingate. But in the neighbouring Notre-Dame Bay, the chief industry is the working of the deposits of copper which is found in pockets or nodules disseminated through the rocks. Deep galleries have already penetrated far into the hills in the district of *Tilt Cove*, a little haven, where nearly all the inhabitants are engaged in the mines. An English company exports the ores and builds roads, railways, and telegraphs in this region, which had hitherto been destitute of all land communication with the rest of the island.

The south coast, especially that of the Avalon peninsulas, south of St. John's, is much more densely peopled than the north. The inhabitants, attracted by the neighbourhood of the banks, are concentrated along the shores, though the poor and rocky soil prevents them from settling in the interior. Here the largest place, formerly a rival of St. John's, is the old French colony of *Plaisance*, which was changed by the English to *Placentia* in the year 1713, when the French soldiers and residents had to evacuate Newfoundland and remove to Cape Breton. Facing it, on the north side of a creek, stands the village of *Little Placentia*, near which are some lead mines. In Placentia Bay the best port is *Burin*, on the west side, where it is sheltered from all winds by a group of islets. The Burin ship-owners equip a large number of smacks for the banks and keep up a brisk trade with the French port of Saint-Pierre.

Farther on there are no large places on the south coast; not one of the villages, such as *Fortune*, *Burgeo*, *La Poile*, and *Port Basque*, has a population of a thousand souls. Near Port Basque, called also *Channel* by the English, are situate

the dangerous reefs, *les Isles aux Morts* (Dead Men's Isles), the scene of constant shipwrecks. At times, after stormy weather, batches of gravediggers have been occupied for several days in burying the dead.

ADMINISTRATION.

The Newfoundland Government, modelled on that of Great Britain, is based on the one hand on the popular will represented by manhood suffrage; on the other, on the royal pleasure directly interpreted by the Governor. All citizens, twenty-one years old, occupying a domicile for two years before the day of the elections, either as owners or tenants, and all men over twenty-five years of age, whatever their residence, have a vote. The island is divided into districts, collectively returning thirty-three deputies to the House of Assembly. These representatives are chosen every four years amongst proprietors with an income of not less than £100, or property valued at £500, and free of mortgages; they receive a subsidy of £40 if residents of St. John's, and £60 if they have their domicile elsewhere.

The Legislative Council consists of fifteen members nominated by the Government for life, and receiving a subsidy of £25 for each session. The Executive Council of seven members is also chosen by the Government, but is responsible to the majority of the Legislature. Lastly, the Governor is appointed by the Crown, usually for a period of six years. The Constitution, which dates from the year 1855, was modified in 1885.

The colonial revenue is derived almost exclusively from the customs, which vary from 10 to 25 per cent., according to the different articles. Coal, fishing-gear, printing-paper, and vegetables are exempt from import dues.

IX.—SAINT-PIERRE AND MIQUELON.

The two islands in the Newfoundland waters left to France by the treaties were well known to the navigators of the sixteenth century, and are specially mentioned by Cartier in 1535. But the little archipelago received no residents properly so called before the year 1604, when some Basque and other seafarers from the west of Europe settled here and occupied themselves with the curing of codfish. But they were expelled by the English, and no fresh settlements were made till the year 1763, when some Acadians, driven from Nova Scotia, sought a refuge in Saint-Pierre; but these also were compelled to emigrate, and in 1778 the whole population of the islands, at that time variously estimated at from 1,200 to 1,932, was expelled and had to take refuge in France.

In 1783 the islands were again thrown open to settlers, and ten years later they contained 1,500 inhabitants, when the English again swooped down, and the French were again banished. No attempt was made at a fresh settlement till the year



PORT OF ST. PIERRE, NEWFOUNDLAND.

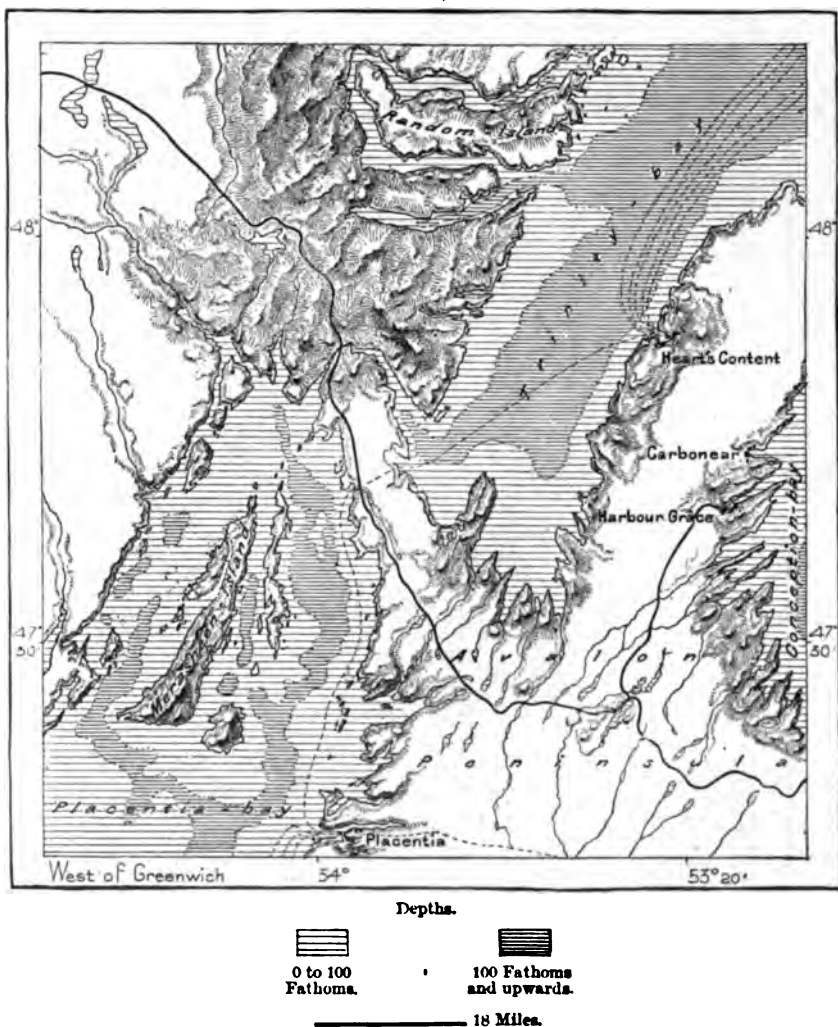


1816, when the islands were restored to France. Amongst the new immigrants were some families belonging to the former exiles.

The treaties are variously interpreted. According to the French the archipelago belongs to France in full and absolute sovereignty, with the right of erecting military works, while the English hold that all fortified works are forbidden. Anyhow none exist, and it would be useless to erect them. Saint-Pierre is nothing

Fig. 174.—PLACENTIA ISTHMUS.

Scale 1 : 500,000.



more than a French fishing-station in Canadian and British waters, but from the ethnical point of view it is the first or easternmost station of numerous French populations, which stretch thence, either in colonies or isolated groups, westwards to Canada and the United States as far as the Rocky Mountains.

The archipelago, a mere geographical dependency of Newfoundland, with which it is attached by submarine beds less than 50 fathoms deep, forms a group of three

which the channel still figured, were wrecked on the sandbank. Ships were also frequently driven by storms on these dangerous shoals, and along the whole length of the isthmus may be seen the ribs of vessels projecting above the sands like the skeletons of cetaceans. From 1816 to 1881 as many as 263 wrecks were recorded on these shores, over four a year.

A strait, misnamed a "bay," although it offers no anchorage and is often very dangerous to shipping, separates the twin islets of Miquelon from Saint-Pierre, which, though of smaller size, is even of more desolate aspect, except in the immediate vicinity of the port. Like Miquelon, Saint-Pierre consists of porphyries interspersed with trappean rocks, and on the slopes underlying sandstones and conglomerates. The highest summit of the so-called "mountain" attains an elevation of 650 feet. Vegetable soil is almost completely absent, the rocks being for the most part covered with lichens. The "forests," as they are called, are a mere tangle of junipers with almost trailing branches, growing five or six feet high. Nevertheless these thickets yield a large quantity of edible berries, which are gathered in the autumn.

The rocky depressions are flooded with ponds, and the slopes are strewn with erratic boulders. Hence tillage is impossible except with imported soil, and in this way the residents of Saint-Pierre have succeeded in cultivating a few garden plots round about their houses.

Langlade is more fertile, and here the people have formed considerable farmsteads for the cultivation of cereals and stockbreeding. In 1881 a species of hare improperly called a "rabbit," was introduced from Nova Scotia, and has rapidly multiplied in Miquelon, as it has already done in Newfoundland.

TOPOGRAPHY.

The archipelago is completed by a few uninhabited islets, rocks, and shoals. Notwithstanding its larger size and greater fertility, Miquelon has fewer inhabitants than Saint-Pierre, which has the advantage of possessing a well-sheltered roadstead, and the town has naturally been established at the point where the fishers are able to land. The permanent population comprises about 2,500 souls; but at the height of the season the streets of Saint-Pierre are crowded by as many as 15,000 persons connected with the fisheries. Normans and Bretons form the chief French element, and there is also a little Basque colony in the place.

A somewhat shallow lagoon at the neck of the sandy isthmus, on the north side of Great Miquelon, might be converted into a harbour; but this coast is rarely accessible to vessels, and it has remained almost uninhabited. Around Saint-Pierre and on the neighbouring Dog Island are concentrated most of the habitations, and near them stretch the grounds for curing the codfish. A numerous floating population, consisting almost exclusively of young Bretons of both sexes, are employed in these curing establishments, which belong to the shippers of Granville, St. Malo, Dieppe, and Fécamp. Bordeaux is the chief French port to which the produce is forwarded.

The industries connected with the fisheries—drying, salting, cooperage, boat-building, storage of the salt imported chiefly from Cadiz—make Saint-Pierre one of the busiest places in these waters. During the season it maintains frequent communication with the surrounding ports of Placentia, St. John's, Sydney, and Halifax. Several of the Atlantic cables touch at Saint-Pierre, thus constituting it one of the chief ganglions in the electric system of the world.

France is represented in Saint-Pierre by a resident governor, and the inhabitants on their part send a delegate to Paris. Each island of the archipelago constitutes a commune, with municipal councillors and a council general elected by the *scrutin de liste*, and meeting twice a year.





CHAPTER VI.

ECONOMIC CONDITIONS OF THE DOMINION.

POPULATIONS.



THE population of the various confederate states or "provinces" and territories constituting the Dominion of Canada certainly exceeded 5,000,000 in 1890, but this population is distributed very unequally throughout this vast domain. Nearly all the inhabitants are concentrated on the shores of the three lower lakes, in the valley of the St. Lawrence, and along the coasts of the Maritime Provinces. A few communities are grouped here and there along the routes leading to the Pacific; but the boundless northern regions are almost uninhabited except by some scattered Indian and Eskimo tribes, and even these appear to be decreasing in numbers. These bleak boreal lands lie still beyond the stream of immigration; but without taking them into account, the habitable parts of the Dominion, that is to say, in a general way, all the territory situated to the south of the isothermal line of freezing-point, are still extensive enough to receive and support with ease at least 100,000,000 human beings. The rapid progress made during the last century is sufficient proof of the great resources possessed by the Dominion. Thus the population rose from less than half a million at the beginning of the century to over two million and a half in 1850, and since then it has about doubled itself.

IMMIGRATION.

The stream of European immigration setting towards Canada has never been as regular in its movement as that which flows to the American republic. It is even difficult accurately to estimate it, for every year a large number of the new arrivals, often estimated at thousands and tens of thousands, merely pass through the Laurentian basin, and continue their route to the United States. On the other hand many Americans or colonists of European origin, domiciled south of the Canadian frontier, again break up their homes, and pass northwards, attracted by the thousand shifting interests of trade or the industries. A continuous reciprocal movement has thus been already developed between the conterminous

states, and although returns have been made of these incessant displacements, the tables have not yet been made with sufficient care to determine for each year the loss or gain resulting from the interchange between the two regions.

In any case a large portion of the direct European immigration to Canada settles permanently in the country. Even if it be estimated at no more than one-third of the whole, it would contribute much to the peopling of the land. This is evident from the fact that during the last twenty years the official returns have never shown less than 18,000 persons in any single year (1860), whereas they rose to over 133,000 in 1883. On an average the arrivals have steadily risen from 20,000 to about 70,000 annually. The slightly higher proportion presented by the male over the female sex in the whole of the population (100 to 97·5) is explained by the very large number of bachelors included amongst the immigrants. Of the native-born inhabitants the women are in the majority.

The ethnical elements annually added to the Canadian population by immigration are drawn chiefly from Great Britain. Ireland formerly sent multitudes of colonists, but this source is nearly exhausted, and at present most of the arrivals are from England. Some thousands of Scandinavians also cross the Atlantic, but they rapidly became Anglicised, and the same fate overtakes the few hundred Germans, who distribute themselves in small groups in various parts of the territory, but especially in Ontario and Manitoba. The French arrive in still fewer numbers, and it is almost exclusively through their own resources, that is, through their surprising fecundity, that the Franco-Canadians are able to hold their ground in the midst of the surrounding populations of English speech, and to continue that peaceful rivalry to which the part played by language and the national temperaments lend such special interest.

THE ABORIGINES.

As regards the Indians, original owners of the land, these international struggles are absolutely unaffected by their presence. Of so little account have they already become that more frequently than not the statistical returns neglect to enumerate them in their periodical summaries. A few half-famished tribes still wander in the solitudes, feebly protected by the missionaries from the continual encroachments of the whites. But most of the natives, surrounded by the rising tide, half-bastardised and debased, are being slowly but surely absorbed in the general population of the country. The 80,000 Indians who live in the so-called "reserves," that is, lands set apart for them, constitute communities of European aspect, where annual returns are made of the houses, the schools and churches, the arable lands, agricultural implements, livestock and produce, in order, as it were, to record the gradual progress they are making in the process of assimilation to the colonists of white race. Conforming even in their political and municipal institutions to the practices of their Canadian neighbours, they will soon have retained no distinctive characters, except perhaps the vague memories of their forefathers.

All the Indian populations are now under the direct control of the Canadian Government.

“ Like an army they have been, and still are, in large numbers, fed and clothed by the Government. With their consent their lands have, in many instances, been sold, until an Indian fund has accumulated, amounting now to over \$3,000,000 (£600,000). Schools have been established for them, and about 140 teachers, many of whom are Indians, are engaged in teaching. In these schools are over 4,000 pupils, and the annual inspection shows good results.

“ Many of these Indians have aided, by their labour, in constructing the Canadian Pacific Railway. In some instances they have become contractors and employers of labour. In one or two instances the tribes have shown themselves so well able to manage their own affairs, that the Government has released them from their position as wards of the country, and has given into their own keeping the moneys obtained from the sale of their lands. Under an Act of Parliament passed in 1884, privileges have been conferred on the more advanced bands with a view of training them for the exercise of municipal powers. Under another act, passed in 1885, Indians, whether on the Indian reserves, or mingling with the general community, have conferred on them the right to vote for members of Parliament on the same conditions as other inhabitants of Canada. The Indians, thus placed on a perfect equality with the whites, demonstrate the success which has attended the efforts of Canada to raise them from their state of savagery to a civilised condition.

“ The same effort, possibly with less promise of ultimate success, especially in the North-West, is being made with all the Indian tribes. Schools and farm instructors are provided by the State. Agents and inspectors have been appointed, whose duty it is to look after the bands committed to their charge; to see that the rations provided are kept up to a uniform standard of excellence; to prevent the Indians being imposed on by worthless and greedy whites; to guard them against the evils resulting from the introduction of spirituous liquors, heavy penalties for which offence are imposed by the State; and generally to aid them in every way to prepare to gain their livelihood as farmers, labourers, and operatives, instead of by the chase.

“ The task undertaken by the people of Canada is a difficult one—no less than the reclamation of over a hundred thousand savages, and the development within them of the essentials of civilisation. It is rendered more difficult by the presence of whites, who bring with them the evils of civilised society. As a compensatory advantage, the Government has the aid of the various Christian denominations, who have established missions in many places, and have won the regard and confidence of the Indians.

“ The difficulties of the task may be understood from the fact that, although on the reserves in the North-West Territories the agents only distribute food twice a week, warning each recipient, at each distribution, that the rations are intended to last for three days, or four, as the case may be, yet so like children are these Red-men that they eat up the whole supply at one meal. They have not yet learned

the wisdom of being provided for three days ahead. So great is the difficulty of teaching them the initial step toward a higher plane of existence.

"The total expenditure, on account of the Indian population, beyond that provided by the Indian fund, was, in 1885, \$1,109,604 (£221,900), of which amount the sum of \$478,000 (£95,600) was expended in the purchase of provisions for the destitute Indians."*

AGRICULTURE.

As must long be the case, the great bulk of the Canadian population, nearly 60 per cent. altogether, belongs to the agricultural class. Although the relative importance of the towns is rapidly increasing, as in all civilised lands, it is still far from being as great as in the other Anglo-Saxon countries, England, the United States, or even Australia. In this southern continent the two cities of Sydney and Melbourne alone contain one-third of the whole population, whereas in the Dominion the ten largest towns contain only one-seventh of all the inhabitants of British North America.

Since 1854 the old feudal division of the land in seigniories, or territorial lordships, has ceased to exist in the province of Quebec, where the "lods" and other burdens have been redeemed by a sum of £300,000 paid to the ground landlords; at the same time the slight remaining ground-rent has been declared purchasable at a reasonable valuation at the option of the tenants in possession. Nearly all have availed themselves of this privilege, and the charge is henceforth optional.

But the arable lands which the Canadian Government has already caused to be surveyed by hundreds of millions of acres, are far from being occupied even as pasturage for livestock. So great is their extent, that the farmer is able to exploit them without any forethought for the future. He usually tills only the naturally fertile ground, and does not even take the trouble to increase the productive power of the soil by manures. Most of the lands are occupied only for the sake of the timber growing on them. The trees are felled, and then the land is abandoned for some future settler to again clear and cultivate it. The giants of the forest are growing rare, for the northern limits to which the woodman has already penetrated enjoy a less favourable climate than the already wasted southern regions, and consequently do not yield such fine timber.

But the resources of the woodlands still amply suffice for all the requirements of Canada, and in no other country is the lumber used up more extravagantly for the construction of dwellings, outhouses, cattle-sheds, bridges, roads, viaducts, as well as in the manufacture of furniture and implements of all kinds. Moreover, the forests support an export trade which represents about one-fourth of the whole commerce of the Dominion. The average yearly value of the timber at present exported is estimated at nearly five millions sterling.

Wheat is the staple agricultural product, and the crop usually exceeds the local consumption. Thus the commercial scales incline almost every year in favour of Canada. According to the years the yield oscillates between twenty and

* E. B. Biggar, *op cit.*

thirty million bushels, or rather less than one-tenth of the French harvest. But in the near future, when the rich wheat-growing lands of the "fertile belt" of Manitoba are brought more under cultivation, the Dominion will probably take a foremost position amongst the grain-producing regions of the globe.

Nor are any of the other European alimentary plants neglected by the Canadian farmers. In some districts, especially in the southern part of the province of Ontario, they have developed magnificent orchards, whose apples and other fruits are of excellent quality. They have even made essays at vine-growing, not, however, with much success, although the summers are amply hot enough to ripen the grape.

A large portion of the agricultural regions is occupied by pastures, and for some years livestock have been bred for the European market. As many as 20,000 horses have also been exported in a single year, and Canada possesses, relatively speaking, more of these animals than any other country. Dairy farming has been rapidly developed, and the Dominion already exports large quantities of cheese to England, but the production of butter for the foreign market has suffered a corresponding decrease. Thus while the export of cheese rose from over 10,000 tons in 1874 to nearly 36,000 in 1885, that of butter fell from over 5,000 to about 3,000 tons in the same period.

The export of wool has also fallen off, though the decline may perhaps be only temporary, and caused by the increasing demand of the local spinning factories for the raw article. In 1885 less than 5,000 tons of wool were yielded by the flocks for exportation. On the other hand, the products of the poultry-yard, thanks to the thrift of the farmers' wives, have acquired increasing economic importance since the middle of the century. Nearly 139 millions of eggs were forwarded in 1885, and in this respect Canada follows at some distance in the footsteps of France, which supplies such enormous quantities to England.

These minor articles have at present a greater annual value in the general trade of the country than the dressed or undressed skins which formerly constituted its chief resource, and which, next to the fisheries, contributed most to its settlement. The total value of the peltries exported in 1888 was estimated at little over £360,000.

HOMESTEADS AND PRE-EMPTIONS.

On these important points much trustworthy information, of great value to intending settlers in the Far West, is supplied by Mr. E. B. Biggar, speaking on behalf of the Dominion Government. It appears that any person, male or female, who is the sole head of a family, or any male who has attained the age of eighteen years, is entitled, on making application to the local agent of the district in which the land he desires to be entered for is situated, and paying an office fee of \$10 (£2), to obtain homestead entry for any quantity of land not exceeding one quarter-section, or 160 acres, of the class of land open to such entry. This entry entitles the holder to occupy and cultivate the land to the exclusion of any other person, the title remaining in the Crown until the issue of patent for the land.

Any person obtaining homestead entry is entitled to obtain, at the same time on payment of a further office fee of \$10, a pre-emption entry for an adjoining quarter-section, and to use and cultivate the same in connection with his homestead.

The settler is allowed six months from the date of obtaining homestead entry within which to complete and perfect such entry, by taking, in his own person, possession of the land, and beginning residence and cultivation, and if the entry be not perfected within such time, it becomes void; except where entry is obtained on or after the 1st of September in any year, and the six months would expire before the 1st of June following, in which case an extension of time to the latter date is granted.

In the case of immigrants or other persons intending to settle, the Minister of the Interior, on requisition signed by them, may authorise any person they may name to obtain homestead and pre-emption entries for them before their arrival in the territory in which the land they desire to occupy is situated, and in such case the time for perfecting entry may be extended to twelve months.

The settler, on proving that he has resided on and cultivated the land for which he has homestead entry, during three years from the date of perfecting his entry, is entitled to a patent from the Crown for the same, provided that he is a British subject by birth or naturalisation; in case of his death his legal representatives succeed to the homestead right; but they, or some of them, must complete the necessary duties.

In cases where it is not convenient for the settler to reside upon his homestead for the three years from the date of perfecting entry, the conditions necessary to obtain patent can be fulfilled by his erecting a habitable house on his homestead, and residing therein for the three months next prior to the date of his application for patent; and from the date of perfecting his entry to the beginning of the three months' residence aforesaid, by his residing, for at least six months in each year, within a radius of two miles from his homestead quarter-section.

He must also, in such case, break and prepare for crop, within the first year, at least ten acres of his homestead; within the second year he must crop the said ten acres and prepare for crop fifteen acres additional; and during the third year he must crop the twenty-five acres already broken, and prepare for crop fifteen acres more.

A homesteader has also the privilege of obtaining a patent for his homestead before the end of three years, by paying the Government price at the time for the land, and proving that he has resided thereon for twelve months from the date of perfecting entry, and that he has brought thirty acres thereof under cultivation.

In case a certain number of homestead settlers, embracing not less than twenty families, with a view to greater convenience in the establishment of schools and churches, and for advantages of a similar nature, ask to be allowed to settle together in a hamlet or village, the Minister of the Interior may dispense with the conditions of residence on the homestead; but the condition of cultivation must be complied with in all cases.

A homestead entry is liable to be cancelled at any time that it is proved that the settler has not resided upon and cultivated his homestead for at least six months in any one year from the date of perfecting entry; but in case of illness, properly vouched for, or in the case of immigrants returning to their native land to bring out their families to their homesteads, or in other special cases, the Minister of the Interior may grant an extension of time during which the settler may be absent from his homestead; but such leave of absence will not count in the term of residence.

A settler, having a pre-emption entry in connection with his homestead, on becoming entitled to a patent for his pre-emption, is entitled to obtain a patent for his pre-emption by paying the Government price for the land; but such payment must be made within six months after he has become entitled to a patent for his homestead; otherwise his pre-emption right is forfeited.

The right of pre-emption connected with homestead entry was discontinued from the 1st of January, 1890. The privilege of homestead and pre-emption are also understood to apply only to agricultural lands.

PROVINCIAL LANDS.

In Ontario, public lands, already surveyed and considered suitable for settlement, may be appropriated as free grants; but such grants are limited in each case to 200 acres. A single man over eighteen years of age, or a married man without children under eighteen residing with him, is entitled to a grant of 100 acres. The male head of the family, or the widow, having a child or children under eighteen residing with him or her, may obtain a grant of 200 acres, and may also purchase an additional 100 acres at the rate of 50 cents (2s.) per acre.

Outside of the free grant townships, uncleared land varies in price from 2s. to 40s. per acre, according to situation and soil. Cleared and improved farms can be bought at prices ranging from £4 to £10 per acre. The money can nearly always be paid in instalments spread over several years.

In the province of Quebec, over 6,000,000 acres of Crown lands have been surveyed. These may be bought by paying one-fifth of the purchase-money on the day of sale, and the remainder in four yearly instalments, bearing interest at 6 per cent. They are sold at such low prices—from 1s. 5d. to 2s. 5d. per acre—that these conditions are not very burdensome. But the purchaser is required to take possession within six months of the date of sale and to occupy it within two years. He must clear, in the course of ten years, ten acres for every hundred held by him, and erect a habitable house of the dimensions of at least sixteen by twenty feet.

In the province of New Brunswick, the purchaser is required to begin clearing and improving his allotment within one month after approval, and within three months he must improve to the value of \$20 (£4); within one year build a residence and cultivate at least two acres; within three years not less than ten acres. In this province, besides the Crown lands, there is a domain of 1,650,000 acres belonging to the New Brunswick Land Company, which may also be obtained on

favourable terms. The soil of New Brunswick is said by Professor Johnston to be capable of producing food for a population of from five to six millions.

In Nova Scotia, there are nearly 4,000,000 acres of Crown lands, much of which, however, is barren and unfit for cultivation. But there is a great deal in blocks of from 5,000 to 10,000 acres of really valuable land, quite accessible and very near present settlements. The price is \$44 (£8 16s.) per 100 acres, and smaller lots may be had at the same low rate.

Lastly, in British Columbia, every head of a family, widower, or single man eighteen years of age, being a British subject, has the right to pre-empt a tract not exceeding 320 acres in extent, north and east of the Cascade Range, and 160 acres in other parts of the province. Personal residence for a period of two years with reasonable intervals of absence, and improvements to the average of 10s. per acre, are necessary to complete the pre-emption right, and entitle the settler to claim his Crown grant in freehold, the price being 4s. per acre, payable in four annual instalments.

Unsurveyed or unreserved Crown lands may be purchased in tracts of not less than 160 acres for one dollar per acre, payable at time of purchase.

THE FISHERIES.

On the other hand, the Canadian fisheries still remain what they have ever been, if not an inexhaustible, at least a chief source of wealth. The innumerable lakes, rivers, and maritime coasts, which have a total length of nearly 6,000 miles, yield an enormous quantity of wholesome and palatable food, the yearly value of which approaches £7,000,000. The annual local consumption per head of the population exceeds 125 pounds including shellfish. Nevertheless, a surplus valued at nearly £2,000,000 is still available for exportation. Altogether the Canadian fisheries, not counting those of Newfoundland, a natural dependency of North America, yield a yearly revenue double those of France, which yet sends to the Canadian waters a considerable number of her fishing-craft.

The fish of Lake Huron and of some of the smaller basins, such as those of Nipigon and St. John, are considered the best of those captured in the inland waters. The maritime provinces of Nova Scotia and New Brunswick naturally take the largest part in this industry, although British Columbia also finds a considerable source of wealth in its well-stocked salmon rivers and in its tinned salmon establishments. Cod alone represents more than one-fourth of the whole value, and next to it in order of importance are the herring, lobster, salmon, mackerel, and others. The produce is exported chiefly to the United States and the West Indies, but England, Portugal, and South America also derive much of their supplies from the Canadian fishing-grounds.

It is easy to understand how important it would be for the Dominion to get rid of all her rivals in the productive field of the Laurentian waters, the monopoly of which she would be willing to share with Newfoundland. Hence those frequent contests between the Canadian fishers and their French and American competitors,

contests which have frequently given rise to angry diplomatic discussions between the interested states. But the Canadian flotillas have other and more legitimate means of securing their superiority. Thanks to the coast signals and the submarine cables connecting all the chief stations, they no longer require to lose time in searching for the shoals, of whose arrival and general movements they receive instantaneous notice.

The vicinity of the coasts also enables them to establish drying and curing grounds at the most convenient points on their own seaboard. They also possess magnificent reservoirs for the live fish, while the progress of marine zoology enables them to found piscicultural establishments, which already yield an income and which will perhaps one day relieve the fishers from the necessity of facing the dangers of the high seas.

"Very few," remarks Erastus Wiman, "realise the vast stretches of coast-line along which Canada controls the greatest fisheries in the world. Bounded, as the Dominion is, by three oceans, it has, besides its numerous inland seas, over 5,500 miles of sea-coast, washed by waters abounding in the most valuable fishes of all kinds. The older provinces of the Confederation have 2,500 miles of sea-coast and inland seas, while the sea-coast of British Columbia alone is over 3,000 miles in extent. It is impossible to take these figures in, and all that they imply, without realising at once the enormous magnitude of this interest.

"But it is not alone in the extent of sea-coast line that Canada has a surplus in fish wealth. In the extreme northern position which she occupies, she possesses an advantage which is of immense value, and this is that the supply of fish food, owing to the extreme northern position, is inexhaustible. As has been truly said by Mr. Harvey, the Arctic currents which wash the coast of Labrador, Newfoundland, and Canada, chilling the atmosphere and bearing on its bosom huge ice argosies, is the source of the vast fish wealth which has been drawn on for ages, and which promises to continue for ages to come. But for the cold river of the ocean, the fish which now crowd the northern seas would be entirely absent.

"The Arctic seas, and the great rivers which they send forth, swarm with minute forms of life, constituting, in many places, a living mass, a vast ocean of living slime. The all-pervading life which exists here affords the true solution of the problem which has so often presented itself to those investigating deep-sea fisheries, the source of food which gives sustenance to the countless millions of fish.

"The harvest of the sea has not yet been gleaned to the same extent as the harvest of the land; but this fact may be taken for granted, that of all the countries in the world, and of all the riches in these countries, nothing can be made more useful, in a higher form, toward sustaining life, or to a greater extent, than the vast wealth of the fisheries of Canada. They are practically inexhaustible, because the cold current of the north brings with it the food on which these fish thrive, and the supply is one that can never fail. The sea-coasts of the Atlantic and the St. Lawrence on the east, the long stretches of the Hudson Bay coast in the centre, and the 3,000 miles of coast-line of British Columbia on the west, are in themselves

a great possession, while the fresh-water fish of the great lakes of the north-west, especially in the supply of the prairie states, should be relatively as great a contribution to the sustentation of human life as are the supplies of cattle on the plains.”*

MINERALS.

The Dominion possesses an abundant store of mineral wealth, and the mining industry has already been considerably developed, especially in the Maritime Provinces, Ontario, and British Columbia. The Nova Scotia gold-mines, which have long been open, still annually yield from £40,000 to £80,000 of pure metal. From the much more productive gold-fields of British Columbia about four times as much is obtained, although the quantity mined has been greatly reduced since more attention has been paid to agriculture. Of other metals the copper of West Ontario and the shores of Lake Superior appears to have acquired the greatest economic importance. Canada, however, possesses vast reserves of iron, and the ores of the finest quality are usually found in the immediate vicinity of the coal measures. Nevertheless, the extraction and manufacture of this metal is still in a backward state, the importation of English hardware and machinery still amply sufficing for all the requirements of the local consumption.

On the other hand, the annual output of the numerous coal-mines in Nova Scotia, Cape Breton, and New Brunswick, as well as in British Columbia, is steadily augmenting, and the coal is of such quality that it already competes with that of England in the markets of the New World. The deposits of the interior distributed along the eastern foot of the Rocky Mountains, and in the districts traversed by the Pacific Railway, will soon be needed for the local wants, all the more that these regions have been almost completely disafforested.

Phosphates, salt, gypsum, petroleum, naphtha, and natural gases are the chief mineral resources of the Ottawa Valley and the Ontario peninsula, while excellent building materials occur almost everywhere. But pending the development of these shores the two essentially mining regions continue to be the regions situated at the eastern and western extremities of the Dominion, Nova Scotia, and British Columbia. The shores of the great lakes constitute an independent centre of mining operations.

Speaking of the vast mineral resources of the Dominion, E. Wiman remarks : “Perhaps of all the surprises which the average American encounters in discussing the wealth of Canada, nothing will startle him to a greater degree than this statement, that no country in the world possesses so much iron as Canada, in no land is it so easily mined, and nowhere is it quite so accessible to manufacturing centres. This is a statement which, no doubt, will challenge contradiction, and it is to be regretted that the space is too small to describe at length the location and precise advantage which the iron supply of this greater half of the continent would afford to the United States. Take the instance at New Glasgow in Nova Scotia, where, within a radius of six miles, there are found deposits of iron ore of

* *North American Review*, January, 1889.

the highest quality, equal to that of any other portion of the world, side by side with limestone, chemically pure, in the immediate vicinity of coal in abundant quantities, from seams thirty feet thick, lying directly on a railway, and within six miles of the Atlantic Ocean! Could there by any possibility be a combination more fortunate than this?

"Throughout Nova Scotia there are deposits of ore of the greatest possible value; but in Quebec, and especially in Ontario, the value of the iron deposits is almost incalculable. Near the city of Ottawa there is a hill of iron called the Haycock mine, which would yield an output of 100 tons per day for one hundred and fifty years without being exhausted. On the line of the Ottawa, on the St. Lawrence, in the eastern townships, on the Kingston and Pembroke railway, on the Central Ontario railway, through Lake Nipissing, in Lake Winnipeg on Big Island, and on Vancouver Island, there are enormous deposits of ore, all possessing the singular advantage of almost complete freedom from phosphorus.

"The peculiar advantage of the Canadian ore in this respect is sufficiently demonstrated by the fact that in the face of a duty of 75 cents (3s.) per ton, this iron is being steadily introduced into the States for the purpose of mixing with other ores, at Joilet, Illinois, at Pittsburg, Pennsylvania, and at other points. A market, such as the United States would afford, if it were free, and the introduction of enterprise and capital, would create for these deposits the same development and the same value that have followed the activity in the Vermillion, Menominee, and Gogebic regions. These latter deposits are almost within sight of Canada, and are but the edge of the great Laurentian range or belt of minerals, which, starting from the Labrador coast, covers the vast area of Canada, paralleling the St. Lawrence and the great lakes, till they find an ending in the Algoma district, a locality that has been aptly described as a great treasure-house of minerals, wanting only the touch of American enterprise, and stimulated by an American market, to yield results far exceeding those of any mineral development on the continent.

"Coincident with the presence of these great deposits of iron ore are discoveries of even greater importance in copper and nickel, and in other metals hitherto nameless but of surpassing value. The copper development at Bruce Mines, and especially and recently at Sudbury Junction, on the north shore of Lake Superior, is likely to be even more profitable than that of the famous Culumet and Hector Mines on the south shore of the same lake, whose payments of thirty millions of dividends, on a capitalisation of two and a half millions of dollars, is a realisation beyond the dreams of avarice.

"Already Ohio capitalists have invested a million of dollars on the line of the Canadian Pacific railway in these deposits.

"The development of nickel, of which there are only two or three known deposits in the world, is of great significance; while in gold and in silver, especially the latter, very excellent success has rewarded the efforts of the prospectors. Perhaps the most marvellous yield of silver that the world has ever seen was Silver Islet, within the Canadian border on the Lake Superior

shore, where for a space of two or three years an output was realised that enriched the owners with a rapidity equalled only by the dreams of the Arabian Nights.

"In British Columbia immense quantities of gold are known to exist, and the fact that over fifty million dollars' worth has been mined from only a dozen localities hardly yet developed is full of the deepest significance, as indicating what yet remains in that distant region to reward the adventurous efforts of the inhabitants of this continent.

"But it is not alone in these prominent metals that Canada is rich in natural resources. In phosphates she possesses enormous quantities of the purest character. No country in the world needs fertilisers more than large portions of the United States, and no country is better able to supply them than Canada. Analysis shows that Canadian phosphates contain phosphoric acid up to 47 and 49 per cent., equivalent to from 80 to 88 per cent. of phosphate of lime. No contribution to the wealth of the continent is of greater value than the development of the Canadian phosphates.

"In asbestos, in mica, antimony, arsenic, pyrites, oxides of iron, marble, graphites, plumbago, gypsum, white quartz for potters' use, siliceous sandstones for glass, emery, and numerous other products, Canada possesses enormous quantities awaiting the touch of man. Lead is found in almost every province, especially in British Columbia, the lead ore there containing as much as fifteen and a half ounces of silver to the ton.

"The deposits of salt are the largest and purest on the continent. Again, another surprise awaits the observer in respect of coal. Canada possesses the only source of supply on the Atlantic and on the Pacific, and between these two there are stretches of coal deposits amounting to 97,000 square miles! The magnitude of the interests involved in this question of the supply of coal, its contiguity, and economy of handling, are of vast importance to the United States.

"It is significant testimony to the important position which Canada holds on the question of coal supply, when it is recalled that away down on the Atlantic the manufacturing coal of Nova Scotia should without doubt supply the manufacturing centres of New England at a minimum of cost; while midway across the continent, in wide stretches of territory of the lowest temperature, supplies should be drawn from the sources which Providence has placed within the Canadian border, and still further that, on the distant shores of the Pacific, San Francisco and contiguous cities should at this time be drawing their supply from the mines of British Columbia, and paying a tax to the overburdened treasury of the United States of 75 cents a ton." *

PETROLEUM.

The presence of oil reservoirs of enormous extent in the North-West Territories has only quite recently been scientifically established. Hitherto, the older and much

* E. Wiman, *loc. cit.*

smaller deposits of the province of Ontario have alone been worked. These cover an area of not more than 5,000 square miles altogether, stretching in one direction about 100, and in another some 50 miles, while the fields actually tapped are limited to a belt 16 miles long by two or three wide, lying 16 miles east of Port Sarnia, and extending nearly parallel with the St. Clair River.

This oil-yielding region of Ontario is divided into two separate districts, about seven miles apart, named, respectively, Petrolia and Oil Springs, and here as many as 3,200 wells have already been sunk. The Petrolia district produces the greater part of the 25 million gallons obtained every year, and also possesses nine out of thirteen refineries now at work in the Dominion. This industry may perhaps seem insignificant when compared with that of the neighbouring States, where the average annual yield of crude oil amounts to about 1,000 million gallons. Nevertheless, it gives employment to about 3,000 hands, and support to a population of over 8,000 souls. The capital invested in this business already approaches £600,000, and the total value of the yearly output is estimated at £420,000. The industry is protected by a duty of $7\frac{1}{2}$ cents (nearly 4d.) per gallon; but it does not provide a supply sufficient for the local demand. Hence a considerable quantity of crude and refined oil has still to be imported from the United States, this trade being estimated, in 1889, at about five million gallons, worth nearly £100,000.

But this position is probably destined soon to be reversed, and instead of depending on foreign supplies, Canada must, in the near future, become a great, if not the greatest, storehouse of petroleum in the whole world. In the year 1888, the select committee appointed by the Dominion Government to inquire into the extent and prospects of the newly-discovered deposits in the Athabasca-Mackenzie basin, reported that "the evidence submitted to your committee points to the existence in the Athabasca and Mackenzie Valleys of the most extensive petroleum field in America, if not in the world. The uses of petroleum, and, consequently, the demand for it, are increasing at such a rapid ratio, that it is probable that this great petroleum field will assume an enormous value in the near future, and will rank among the chief assets comprised in the Crown domain of the Dominion. For this reason your committee would suggest that a tract of about 40,000 square miles be for the present reserved from sale, and that as soon as possible its value may be more accurately tested by exploration and practical tests; the said reserve to be bounded as follows:—Easterly, by a line drawn due north from the foot of the Cascade Rapids on Clear Water River, to the south shore of the Athabasca Lake; northerly, by the said lake shore and the Quatre Fourche and Peace Rivers; westerly, by the Peace River and a straight line from Peace River Landing to the western extremity of Lesser Slave Lake; and southerly, by said lake and the river discharging it, to Athabasca River and Clear Water River as far as the place of beginning."

The significance of this announcement will at once be seen, when it is stated that the Russian deposits at Baku on the Caspian, at present by far the most productive in the world, have a total area of only 1,600 square miles. But it

hundred miles due north to Edmonton (which is connected with the station by a coach road) he will reach the fringe of this great oil region. From the Edmonton district, the oil belt stretches the whole distance in a north-westerly direction to the mouth of the Mackenzie River, a length of quite 2,000 miles as the crow flies. The Athabasca River runs through the middle of the oil district, which includes the whole of the Lesser Slave Lake on the one hand, and touches the shores of the Beaver Lake on the other. The Peace River is entirely included in the district, from the moment it quits the Rocky Mountains, until with the Athabasca it flows into the Great Slave Lake, a course of over 1,000 miles; and from Fort Smith, close to where they jointly flow into the lake, to the mouth of the Mackenzie River, a navigable run of 1,360 miles, there is oil the whole way. The general area is larger than that of all the petroleum districts of the present oil-producing countries put together.

“These boundless treasures have hitherto been entirely neglected, simply because the completion of the Pacific Railway has only quite recently brought the country within reach of the world’s steam communications. At no distant date Edmonton will be connected with Calgary by railway, as well as the Athabasca Landing, 90 miles farther north. This has been recommended as a good point for commencing operations, on account of its connection with the water communications of the Mackenzie River and Hudson Bay. Another outlet is available by means of the Saskatchewan. Thirty miles from the Grand Rapids, according to Professor Bell, there is a visible petroleum field stretching ten miles along the river. Wells would easily strike oil at 400 feet or so at this spot. From here there is a steamboat run of 125 miles to Athabasca Landing, and, pending the railway, a pipe line 90 miles long (a mere trifle as pipe lines go) would bring it to the Saskatchewan River, where it would touch the water communications running to the Canadian Lakes, meeting on its way down the river the railway system at Battleford or Prince Albert when complete.

“We may therefore say that this great oil region has two sea outlets *via* the Mackenzie River and Hudson Bay, a lake outlet by means of the Saskatchewan, and, in embryo, two railway outlets by way of Edmonton and Calgary on the west, and Battleford or Prince Albert on the east. Climatically, it may be said that although a deal lies in northern latitudes, yet, owing to the warm currents of air from the Pacific—a well-known peculiarity of the region—the whole of the 40,000 miles of the proposed oil domain compares favourably with Middle and even Southern Russia. The Mackenzie River is a far better sea outlet than the Northern Dwina, on which Archangel is situated, and on which Russia solely depended for maritime intercourse with the world until Peter the Great provided another at St. Petersburg; while at Fort Simpson, on the Mackenzie River, nearly 1,000 miles north of the oil fields nearest the Pacific Railway, the winter is not so long as the winter of St. Petersburg. The southern oil fields experience warmer winters than many of the American states, and the climate is not so cold as in Manitoba. We may consequently strike the generalisation that while Russia’s petroleum fields lie in the hot region of the Caspian (Old Persia), and the

petroleum fields of the United States in the cold winter quarter of Pennsylvania and New York, England enjoys the double advantage of hot and cold petroleum fields; those of Burmah being a little hotter than Baku, and those of Western Canada a trifle colder than Pennsylvania. This advantage is something more than one to be held out as a mere inducement to fastidious capitalists, because Nature seems to have established a relation between the characteristics of crude petroleum and the climate in which it is found. The Baku and Burmese oils are essentially oils for hot climates, while Pennsylvanian petroleum is better adapted for temperate and cooler regions. I venture to predict, therefore, that when the great oil fields of Canada are opened up, the oil will be found to have an affinity with the Pennsylvanian, and will afford light not only for the future millions of the Dominion, but also for the present millions of the Pacific freeboard, both on the American side and in China and Japan." *

It remains to be stated that in the spring of 1890, the Canadian Government sent a scientific expedition under Professor Dawson, to examine the Athabasca oil fields, at the same time sanctioning the construction of the proposed railway from Calgary on the Canadian Pacific Line, to Edmonton on the border of the oil region, one half to be built this year, the rest next year.

TRADE.

The exports of a young country like Canada to Great Britain and the United States, where the industries are so much more highly developed, must naturally consist mainly in raw materials, the natural products of the agricultural and mining industries. Planks, battens, and lumber of all sorts, horned cattle, sheep, horses, and other animals, cheese, hides, skins, wool, and peltries, cod, salmon, and other fish, lastly coal and gold are the articles of the export trade, manufactured goods being mainly limited to tanned and dressed skins, wooden wares, and other articles not requiring complicate manipulation. Canada also builds a few wooden vessels for foreign use.

Nevertheless, manufacturing activity directed towards the supply of the local wants has received a great stimulus since the year 1879, when the Dominion, having already acquired the right of regulating its own tariffs, adopted the principle of protection. Heavy duties were even imposed on manufactured goods imported from England, the suzerain country being treated like the United States, and paying the same dues on its manufactured imports. Since that time the number of artisans has doubled, and the amount of capital invested in the various manufactures has increased threefold. New industries, such as sugar refineries and cotton spinning, have been founded, and every branch of the manufacturing industries is now represented in the towns of the Laurentian regions. Factories have been multiplied especially in the Maritime Provinces and in the southern parts of Ontario, a country where the whole social system is assuming an industrial character.

* Charles Marvin, *The Coming Oil Age*, 1889.

The most flourishing industries are the flour and saw mills, the tanneries, wool-spinning, and the boot and shoe business. Canada is also becoming independent of England in the clothing and furnishing departments. Thus an increasing proportion of the raw materials, all of which were formerly exported, is now needed to meet the demands of the local factories.

Including both imports and exports, the general movement of the exchanges already exceeds £40,000,000, which is at the rate of £8 per head of the population, a proportion little inferior to that of France. This traffic is made almost exclusively with Great Britain, the suzerain country, and with the United States, the conterminous region whose provinces overlap those of the Dominion about the central districts of the great lakes and along the right bank of the St. Lawrence. Till recently England held the first position in the international trade of Canada. But despite the old relations and the greater facilities afforded for trade with the mother country by the increasing number and speed of the transatlantic liners, the balance is steadily inclining in favour of the great republic, whose imports actually exceeded those of Great Britain by nearly £700,000 in the year 1889.*

The States, with a population rapidly approaching 70,000,000, necessarily exercises an increasing attractive influence on the neighbouring confederacy, which, though about equal in extent, is relatively far inferior in power, population, and general development. The movement of the exchanges between the two countries is even greater than is indicated by the official returns, for the contraband trade is easily carried on at a thousand points along a common frontier stretching from ocean to ocean.

In many places produce forwarded to Europe passes either through Canadian or United States territory. Thus the commodities sent from Minneapolis and the Upper Mississippi basin to the destination of Great Britain are conveyed, as a rule, by the so-called "Soo" railway, that is, the line which follows the route of the Sault Sainte-Marie. Even Chicago and Detroit find it convenient to send their more bulky and relatively less valuable wares to Europe by the line of the great lakes and the St. Lawrence. On the other hand the direct routes from Toronto, Montreal, and Quebec to that part of the Atlantic seaboard which lies south of the Chignecto isthmus necessarily pass through New York and New England territory.

The collective trade of Canada with countries other than Great Britain and the United States represents only about one-eighth of the exchanges. Amongst these secondary clients the foremost place is taken by the "West Indies," that is, the English, French, and other Antilles, and the traffic with these islands is rapidly increasing, thanks to the increasing facilities of intercommunication created by the new lines of deep-sea steamers. The relations with France, abruptly interrupted by the British conquest, remained in abeyance for about a hundred years, and even now are very slight. In fact the trade of France with Canada is less even than that of Germany, being mainly limited to fancy wares and "articles de Paris" taken in exchange for Canadian raw materials.

* See Appendix I.

Next to Germany and France the most important place in the international exchanges is taken by the neighbouring colony of Newfoundland, whose annual trade with the Dominion is only about £150,000 less than that of France. At present the Canadian men of business are making the most strenuous efforts to place their commercial relations with the Australasian colonies on the solid foundation of mutual interests. Their analogous political conditions of common allegiance to the Crown of England serve as an argument for obtaining subsidies to support independent lines of steam navigation across the Pacific.

ROUTES—"THE QUEEN'S HIGHWAY."

Since the completion of the Pacific Railway Canada offers the most direct route between England and the extreme East, constituting what has been called the "Queen's Highway," by which troops could be despatched to Hong-Kong if not to Singapore more rapidly than by the Mediterranean and Red Sea. When the question of subsidising a line of first-class royal mail steamers between Vancouver, the Pacific terminus of the trans-continental railway, and China, was recently discussed in the House of Lords, it was pointed out that the journey from England by the Peninsular and Oriental route *via* Suez to Hong-Kong took from 33 to 37 days, and by the Canadian-Pacific from 32 to 35 days; to Shanghai 37 and 32, to Yokohama 41 and 27 days respectively. It was shown generally that the Vancouver route was in many cases better than the existing lines, and in any case it was an excellent alternative in case of difficulty and danger in time of war. The subsidy would give England five distinct imperial and commercial advantages—first, a rapid through postal and passenger route to the East; second, the means of establishing an independent telegraphic line to the East; third, the means of rapid and cheap transport of troops and stores across the American continent to British India; fourth, a third and possibly the most important route to the East; and fifth, the provision of ships which would form part of the service at the Pacific end of the route, and which would be constructed as cruisers in accordance with the requirements of the British Admiralty. Thus through Canadian territory passes the highway to Cathay, and the name of China (Lachine), given by anticipation to the outpost of Montreal by the first French settlers, has already been justified.

SHIPPING.

The Dominion takes a high place amongst those states which possess a large mercantile navy. Although officially a single dependency of Great Britain, it exceeds most other nations in the importance of its registered tonnage, being surpassed in this respect only by Great Britain, Germany, and Norway. In 1889 it comprised over 7,000 sailing-vessels, and nearly 1,400 steamers of about 1,180,000 tons burden, including the flotillas of the St. Lawrence and the great lakes. Notwithstanding its position in the centre of the continent, Manitoba possesses its com-

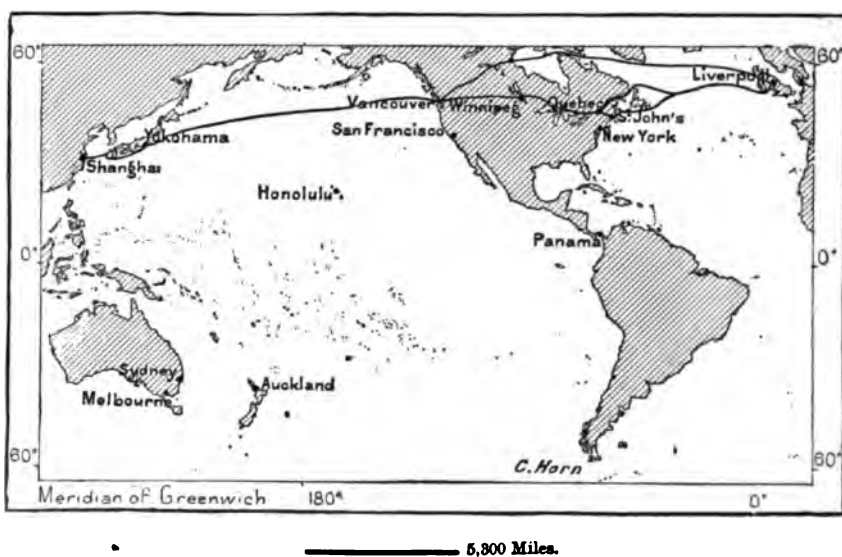
mercial marine like the other states of the Dominion. But most of the shipping naturally belongs to the Maritime Provinces—Nova Scotia, New Brunswick, and Prince Edward Island, over 4,200 vessels of about 800,000 tons altogether. But Quebec and Ontario own the largest number of steamers, most of which, however, are of small size. At present scarcely any sailing-vessels are built, and the yearly increase is almost entirely in steamers.

CANALS.

The marine highways and navigable routes presented by the rivers and lakes of the interior are supplemented by numerous artificial canals. At first all the rapids of the St. Lawrence had to be turned in order to open an uninterrupted

Fig. 177.—DIRECT ROUTE FROM ENGLAND TO CHINA.

Scale 1 : 250,000,000.



highway from the sea to Lake Ontario. Then this basin had to be connected with Lake Erie by the Welland Canal, and another is now in course of construction north of the Sault Sainte-Marie, which will dispense the Canadian shipping from passing through United States territory. The only point at which Canada is for the moment dependent upon the United States is in the matter of the Sault Sainte-Marie Canal, connecting Lake Superior with Lake Huron, which canal is on United States territory; and under the terms of the Non-Intercourse Act, it would, of course, be closed against Canadian traffic. But the Dominion Government has proved itself equal to the occasion by voting a large sum of money for the construction of a new canal on Canadian territory connecting the two lakes; so that when this is finished Canada will have an independent waterway from east to west as well as an inde-

pendent through railway system.* In ordinary times, however, all these connecting links between the St. Lawrence and Lake Superior are open to the shipping of both states without any preferential charges.

Communication has also been effected by canalisation between the navigable part of the Richelieu River and Lake Champlain and the network of the American canals. Lastly, the Ottawa and Lake Ontario have been similarly connected through the chain of lakes traversed by the Rideau Canal. A direct route from Ontario to Georgian Bay, north of the peninsular region of Upper Canada, is urgently needed; but the works of canalisation, long commenced, still remain in an unfinished state.

The canals of the Dominion, formerly excavated to a depth of nine feet, have

Fig. 178.—NETWORK OF THE EAST CANADIAN RAILWAYS.

Scale 1 : 20,000,000.

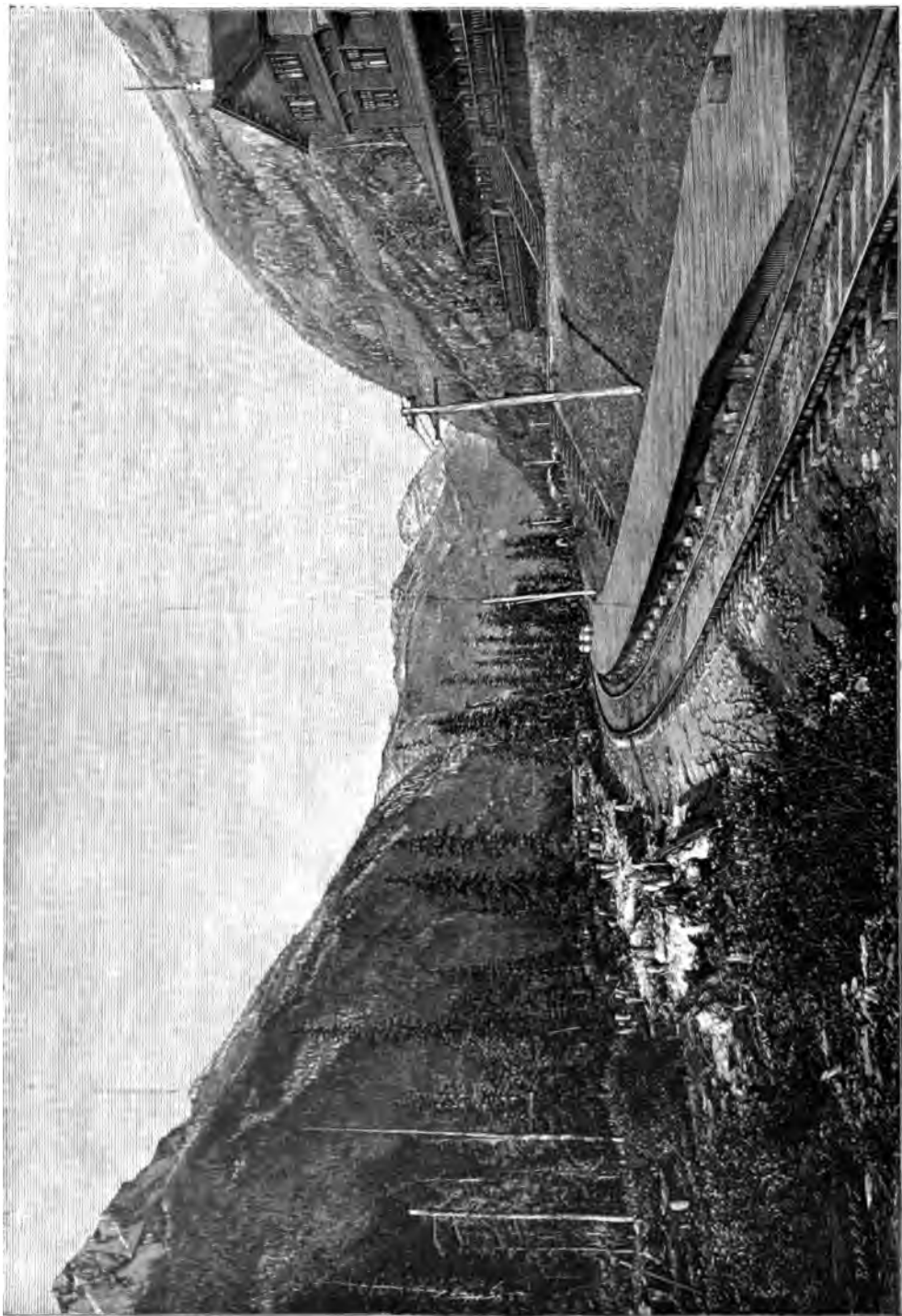


now a depth of fourteen feet, and, in some places, even more. Although their collective length is not great, they serve the purpose of completing the natural system of navigable lakes and rivers, and, thanks to them, the shipping with the United States has acquired an enormous development. Relatively to its population the Dominion of Canada possesses a larger movement of navigation than any other country in the world.

RAILWAYS.

Such a vast extent of inland navigation naturally stimulated the development of a widely ramifying railway system. In 1835 the first Canadian line was

* Stuart Cumberland, "The Queen's Highway," p. 418. When completed, this Canadian Sault Sainte-Marie Canal will overcome a difference of 18 feet in the levels of Lakes Huron and Superior, and this will be effected by a single lock 600 feet long and 85 feet wide. The gates of this lock will be worked by hydraulic power, and the canal is already crossed by a railway bridge which effects a junction between the Canadian and American railway systems on that frontier.



KICKING-HORSE PASS, ON THE CANADIAN PACIFIC RAILWAY.



opened between Laprairie and St. Jean on the Richelieu. In 1844 the country still possessed only thirteen miles of railway, but about the middle of the century two main lines were taken in hand, the Inter-Colonial, to connect the Maritime Provinces of Nova Scotia and New Brunswick with the great cities on the St. Lawrence, and the Grand Trunk, which unites them with the Atlantic ports of the United States.

The Canadian Pacific, the great artery of the Dominion, and of all the American trans-continental lines the most direct route for the trade of the world, was only begun in 1880 ; but within five years of that date this stupendous work was already completed throughout its entire length from ocean to ocean. It is now being

Fig. 179. — TRANSCONTINENTAL RAILWAYS OF NORTH AMERICA.

Scale 1 : 53,000,000.



supplemented by feeders and lateral branches of all kinds, which are ramifying north and south, and will, doubtless, ultimately reach the Yukon basin in the extreme north-west, and Hudson Bay in the north-east. Although little more than a wilderness in proportion to its whole extent, the Dominion already occupies the eighth place amongst the nations of the world in respect of its railway communications, which are increasing at the rate of about 600 miles a year. Most of the lines are owned by private companies, not more than 1,150 miles, with an invested capital of over £10,000,000, belonging to the State.

The great Pacific Company, highly favoured with grants of money and public lands from the Federal Government, is almost as rich as the State itself. The main line from Quebec to Vancouver has alone a length of 3,100 miles, and it is now more than doubled by several lateral lines, all laid down on the same conditions as the first, that is to say, by means of liberal concessions of lands bordering

both sides of the rails and naturally chosen in the most fertile districts. A society of capitalists has thus become the owner in fee simple of a vast territorial domain, the sale of which can be so controlled as to keep the purchasers more or less dependent on the association. The possession of the most favourable sites for the foundation of the new towns which the Company helps to create, adds other privileges to those secured by a complete monopoly of the transit trade. Many towns are already excluded from access to the very lakes on whose shores they have been founded. Certainly, this work of immense public utility could never have been undertaken without the inducement of substantial concessions in lands and privileges. At the same time it cannot be denied that a certain danger attaches to the creation of such a powerful corporation, a State within the State, which will scarcely fail to use its enormous resources and political influence in promoting its private interests at the expense of the general welfare. The same company is, directly or indirectly, controller of the ocean steamers by which the "Queen's Highway" is continued in one direction towards England, in the other towards China and Australasia.

The superiority of this route, even over that of San Francisco, for the communications between Great Britain and Japan, is shown by the subjoined comparative tables of time and distances between Liverpool and Yokohama.

DISTANCE.	PACIFIC OCEAN.	RAILWAY.	ATLANTIC.	TOTAL.
	Miles.	Miles.	Miles.	Miles.
By San Francisco and New York. }	4,470	3,271	3,130	10,871
By Vancouver and Quebec. }	4,232	3,053	2,661	9,946
Saving in miles . .	238	218	469	925
TIME.	Days.	Days.	Days.	Days
By San Francisco and New York. }	12·10	5·17	8·16	26·19
By Vancouver and Quebec }	11·18	3·15	7·09	22·18
Saving in time . . .	0·16	2·2	1 07	4·1

TELEGRAPHS—POST—EDUCATION.

Like the railways, the telegraphs are mainly owned, not by the State but by private companies. The Federal Government has established the network of lines between the fishing stations round the Gulf of St. Lawrence, as well as the shore line along the coast of Canadian Labrador, which reports all accidents that are of such frequent occurrence in the Strait of Belle-Isle and the neighbourhood of the banks. The State has also undertaken the construction of the lines, unprofitable in a commercial sense, which connect the various military or police stations of the North-West Territories, the Indian Reserves, and the factories of the Hudson Bay Company, and it has, moreover, laid a submarine cable between Vancouver and the coast of Oregon.

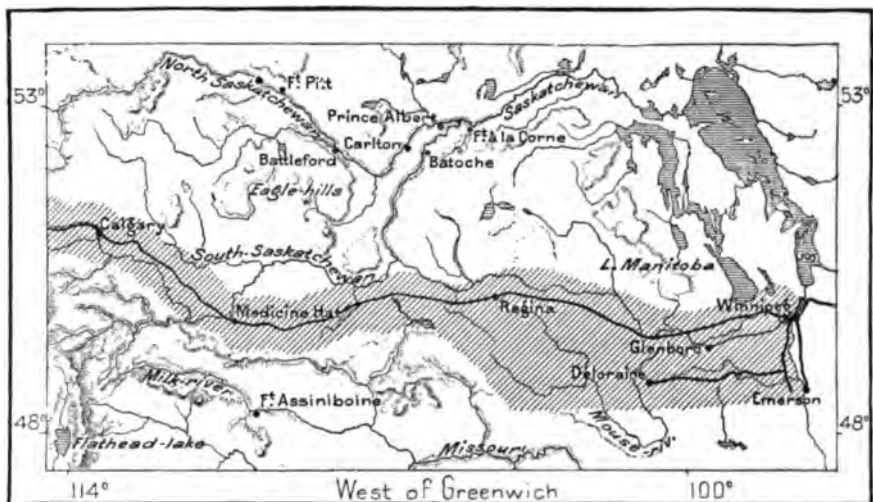
On the other hand, the wires stretching from town to town in the more settled districts, as well as those connected with the Atlantic cables between the Old and

New Worlds, have been constructed at the risk of private speculators, though not always without public aid. The transcontinental system will soon be supplemented westwards by cables running in the direction of Australia and China through the Sandwich Islands. Thus will be completed the magnetic girdle round the globe. In 1890 a cable 874 miles long was laid between Halifax and the Bermudas, and the Imperial Government contemplates extending the system thence to the British West Indies.

The telephone system is also extensively used in all the more populous parts of the Dominion. It is already at work in about 200 towns, 175 of which are con-

Fig. 180.—DOMAIN OF THE PACIFIC RAILWAY COMPANY.

Scale 1 : 13,000,000.



 Lands granted in alternate lots with Government Free Grant Lands.

315 Miles.

nected by telegraph. As many as 10,000 sets of instruments are stated to be in use at the various exchanges and agencies throughout Canada.

The postal movement is about doubled once every ten years. The increase is naturally more rapid than that of the railway, or even of the population itself, because it represents two distinct lines of progress mutually reacting on one another—the development of trade and of public instruction.

Relatively to the population the progress of education is very remarkable, for no less than one-fifth of all the inhabitants of the Dominion are receiving instruction, and of these about two-thirds are regular attendants at the public schools. In this respect Canada is in advance of the neighbouring republic, though inferior to it in the development of the periodical press. This, however, is a factor which has less to do with the real state of instruction than with the keen rivalries of hostile parties contending for political power. The first newspaper published in the territory of the

Dominion appeared at Halifax in 1752, and the first printed entirely in French was issued at Quebec in 1806. At present there are about 800 journals altogether, and of these the immense majority are English, not more than 10 per cent. being French.

It is often asserted that crime is much more rife amongst the English- than amongst the French-speaking section of the inhabitants. Thus drunkenness, which, however, seems to be diminishing in all the provinces of the Dominion, is said to prevail especially in Manitoba, the North-West, and British Columbia, almost exclusively Anglo-Saxon territories. But such is not the case, although it is quite true that the consumption of beer increases according as that of wine and spirits decreases. Pauperism, which was supposed not to exist in Canada, is already making its appearance amongst the proletariat classes of the manufacturing towns.

ADMINISTRATION AND GOVERNMENT OF THE DOMINION.

The Canadian commune is autonomous, except in Prince Edward Island, where, in virtue of the Royal Charter, the municipal power is still centred in the hands of the landowners. Although the Canadian Confederation has a monarchical organisation in its central government, nevertheless its primitive elements, its townships or rural districts, all form so many little republics, regulating their local affairs according to the pleasure of the majority. "In Canada," it has been playfully remarked, "politics are distributed by the square mile more than in any other country in the world."

At the same time the Canadians are far more free in their local administration than, for instance, the inhabitants of the French Commune, which is nearly entirely dependent on the central power, despite the republican form of the State. The council of each municipal group, annually elected by the ratepayers, votes the acquisition and administration of the communal property, the appointment of the local officials, the grants to agricultural and manufacturing bodies, the amount and appropriation of fines. The Municipal Council also controls the sale of alcoholic drinks, authorising or interdicting the trade within the communal limits.

PROVINCIAL AND FEDERAL REPRESENTATION.

Each of the provinces constitutes a distinct state, controlling its own revenues and framing its own laws in a parliament, whether of one house as in Ontario, or of two as in the province of Quebec. It appoints its own officers and secondary magistrates, and has the entire control over the internal administration and local legislation. Nevertheless, the provinces lack all sovereign rights as regards the organisation of the military forces, the national defence, the levying of customs and excise dues, the direction of the postal service, the dispensation of justice in criminal matters and divorce. Moreover, the laws enacted by the provincial parliaments may be set

aside by a veto of the central power as opposed to the general constitution or interests of the Confederacy.

The North-West Territories, which are not yet constituted in provinces properly so called, have a mixed administration consisting of deputies elected by the people, and of functionaries nominated by the Canadian ministry. Each province receives an annual subsidy from the Confederacy.

For Government elections the franchise is extended to all British subjects by birth or naturalisation over twenty-one years of age in the enjoyment of a certain income or holding property varying in value according to the circumstances of tenure. Thus an estate owned or occupied worth £60 in an urban, or £40 in a rural district, or of the yearly value of £4, or else an income of £60 from earnings or investments entitle to a vote. Voting is by ballot, and the franchise is uniform throughout the Dominion except in the North-West Territories, where every male resident for a twelvemonth, twenty-one years of age and not an alien or an Indian, enjoys the franchise. Women are excluded, as are also the Chinese. The latter are even required to pay an entrance tax of £10 for permission to reside in the country, where they are treated as so much merchandise by the railway officials, being transported in closed cars from one end of the territory to the other. The Indians, who have given up the tribal organisation and settled in the reserves, are assimilated politically to the whites. All strangers may become citizens after a residence of three years; by simply taking an oath of allegiance before a magistrate they can demand a certificate of naturalisation, entitling them to all the rights and privileges of a British subject.

The Canadian Parliament comprises two Chambers, the House of Commons and the Senate. The first, or Lower House, is elected for five years, unless sooner dissolved, on the present proportion of one member for every 20,000, but so that the province of Quebec shall always have 65 representatives. Those of the other provinces vary according to each decennial census according to the relative importance of their population. At present the preponderance of Ontario is so great that it commands nearly half the votes of the House of Commons, 92 in a total of 214 deputies. Having, moreover, the advantage of possessing the capital of the Confederacy within its limits, this province really disposes of the numerical majority at divisions.

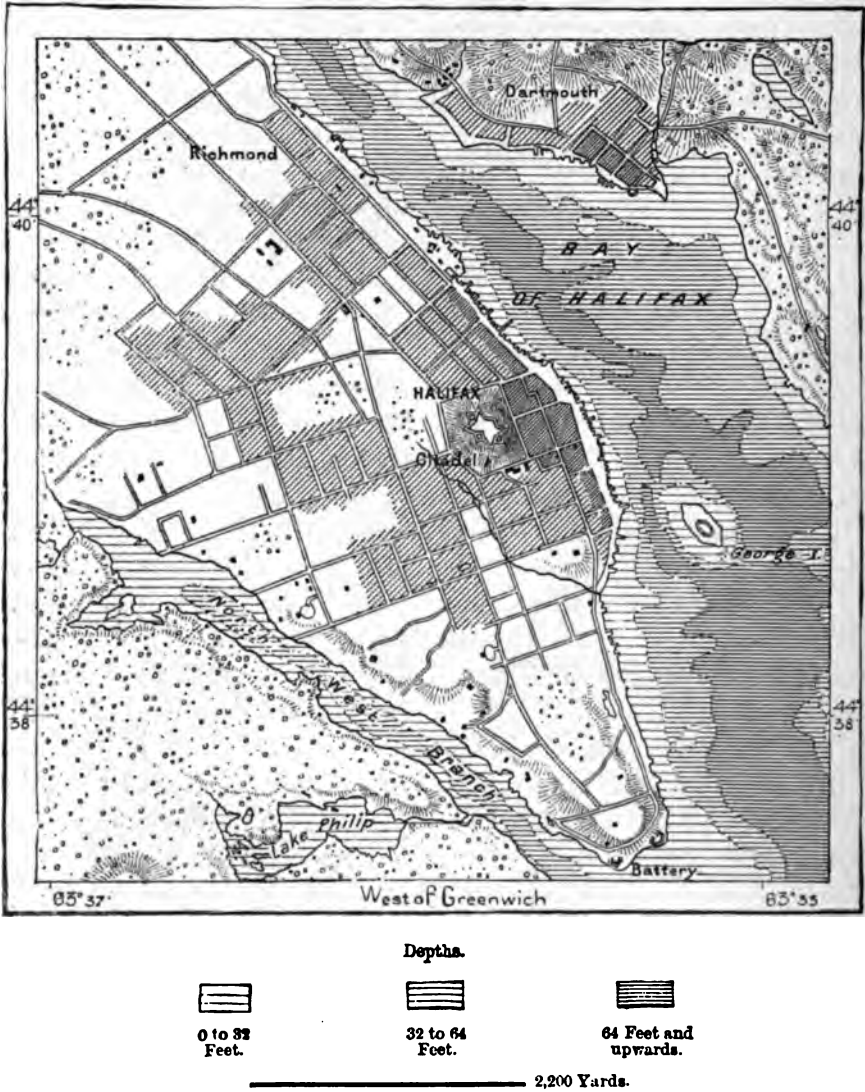
The 78 members of the Senate, or Upper House, are appointed for life by summons of the Governor-General under the Great Seal of Canada. All born or naturalised subjects are eligible who are thirty years old and possessed of real or personal estate valued at £800 in the province for which they are appointed, and in which they are officially required to be domiciled.

The Governor, representing the Queen, but paid by the Dominion, is President of the Ministry, which consists exclusively of members of the Canadian Parliament chosen by the majority, and responsible to the Chambers. He resides at Ottawa, seat of the Parliament and capital of the Confederacy. It has often been proposed to withdraw the capital from the jurisdiction of Ontario, and constitute it a federal city, as are Washington and Buenos Ayres in other American states.

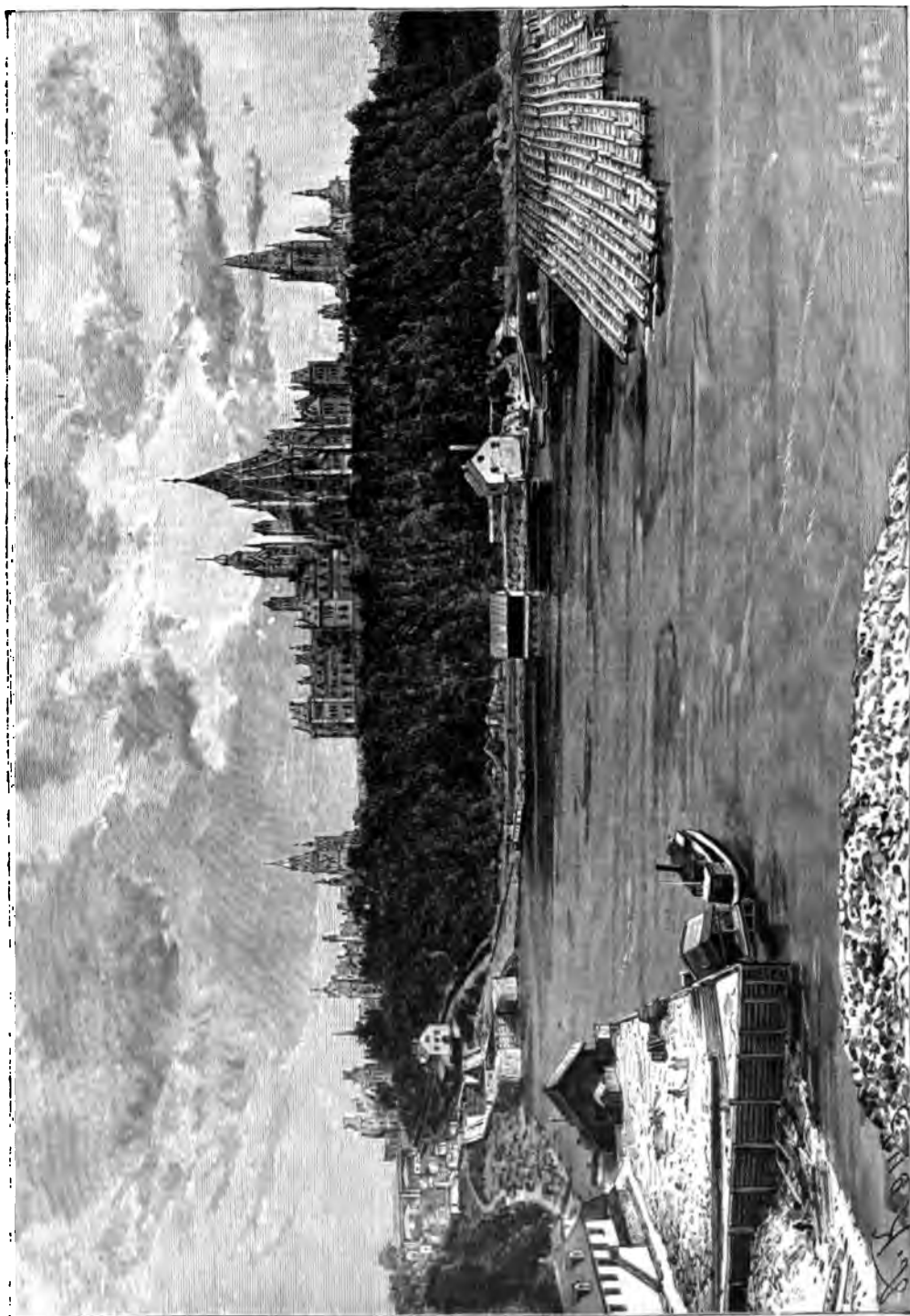
ARMY.

Canada possesses the mere framework of a standing army. Formerly, when it was a simple colonial dependency of Great Britain, its citadels and chief towns were garrisoned by British troops, while English fleets guarded the seaboard.

Fig. 181.—HALIFAX AND ITS CITADEL.
Scale 1 : 55,000.



But since she has assumed the management of her own affairs, the Dominion has also to take measures for her own defence. The Imperial Government only keeps an armed force of about 2,000 men in the important naval station of Halifax. A small garrison is also still retained at Esquimalt for the purpose of



THE DOMINION PARLIAMENT—VIEW TAKEN FROM THE OTTAWA.



guarding the shores of British Columbia. But this provisional arrangement has not been finally settled.

Legal provision has been made for the levying of regular troops, though there has hitherto been no occasion to apply the law, the number of volunteers having always exceeded the number of men required for the service. The nominal strength of the active militia stands at 43,000 men for the whole of Canada, but the effective strength of the thorough-trained volunteers scarcely exceeds 30,000. Those drawn from the towns serve under arms twelve days every year, but those enlisted in the rural district are called out only every second year. While under arms for the regular exercises, the men draw a small pay, and are also armed and equipped at the cost of the Government.

Government also maintains the "Royal Military College" of Kingston, besides eight smaller military establishments, where men are thoroughly trained for a special corps destined to form the nucleus of a permanent army. In the north-western regions about 1,000 men constitute a body of "Mounted Police," who scour the plains in various directions, the chief duty being to control the Indian tribes and keep them in their camping grounds. This is the most active corps in the Canadian militia. In proportion to their numbers the French Canadians are far less numerous in the volunteer service than the English. Whatever be said to the contrary, the Anglo-Saxons take more pleasure than other races in "playing at soldiers."

Besides the regulars there is a reserve including all able-bodied men between 18 and 60 years of age, and comprising altogether about a million of soldiers disposed in four classes, according to age and family circumstances. But no division of this vast force has ever been exercised or even armed. It has merely a contingent existence, ready, however, to be called into being, in case the national independence were menaced. The largest demand for troops occurred in 1870, when the Irish Fenians threatened to invade the country from the United States. On that occasion the Canadian forces, comprising nearly 20,000 men and 20 guns, were massed at all the vulnerable points of the frontier. On two other occasions, the volunteers were also summoned to enter the field against the French half breeds of the north-west, and they responded in both instances with alacrity to the call.

The military expenditure is so slight as scarcely to be felt as a burden. In 1888 it was little more than a quarter of a million sterling. A Minister of War, a member of the Ottawa Government, takes charge of all military matters, but the Commander-in-Chief is an English Major-General, "lent" by the Crown, but paid by the Dominion.

ADMINISTRATION OF JUSTICE.

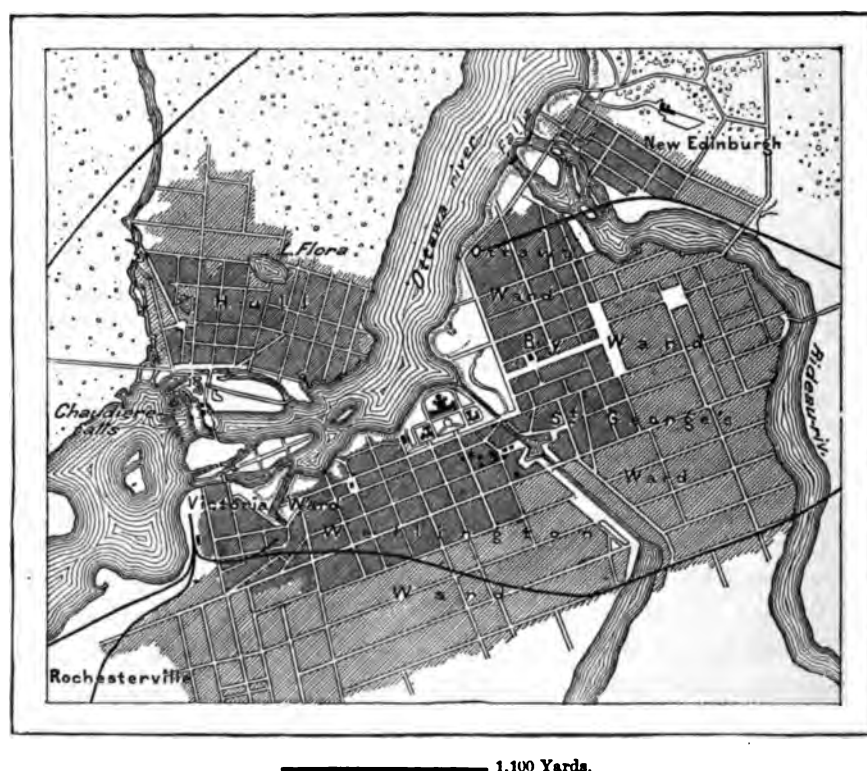
In the same way the judicial hierarchy is linked with the Home Government, the Queen's Privy Council being the supreme tribunal or last court of appeal. In civil cases there is a continual stream and counter-stream of pleaders and barristers between the Canadian and London courts of justice, much to the

benefit of the lawyers, but involving considerable expense and endless judicial complications.

Yet Canada might seem amply provided with judges and tribunals without having recourse to the British courts. The various municipalities, if petitioned by a hundred owners of property, can call upon the provincial Lieutenant-Governor in council to appoint a court of commissioners analogous to the English Small Debts' Courts, sitting without stipend, and deciding without appeal all matters of debt not exceeding the sum of £5. The mayors of the municipalities are also magistrates,

Fig. 182.—OTTAWA, CAPITAL OF THE DOMINION.

Scale 1 : 550,000,



with functions similar to those of the justices of peace, appointed by the Lieutenant-Governor from persons possessing property of the minimum value of £240. They have both civil and criminal jurisdiction, may arrest people charged with the commission of a crime, examine witnesses in the preliminary proceedings, and prepare the indictments to be tried by the qualified tribunals.

Then follow in regular order the judges of the sessions of peace, the police magistrates and the recorders, also nominated by the Lieutenant-Governor. Circuit courts, presided over by one of the judges of the higher court, are held in each judiciary district, comprising a certain number of counties. They have civil jurisdiction, limited, however, to cases of slight importance, whereas the

higher courts take cognizance of any case, whatever be the value of the property or sums in dispute. According to circumstances these higher tribunals are subdivided into courts of revision and courts of bankruptcy.

The Court of Queen's Bench, the highest court of appeal in each province, has jurisdiction both in civil and criminal matters. It consists of six judges, of whom one alone presides at the criminal assizes, where cases are heard before a jury of twelve, while the other five constitute a court of appeal.

The judges of the higher courts and of Queen's Bench are nominated by the federal government, but the organisation of the tribunals, the constitution of the courts, and method of procedure depend on the provincial government. Above all these provincial tribunals stands the Supreme Court of Ottawa, composed of a chief justice and of five puisne judges appointed by the Sovereign. It exercises jurisdiction in appeal cases for the whole of Canada in all criminal matters, but only in civil suits where the sum in litigation exceeds £400. The Supreme Court acts at the same time as a political council, and may take cognizance of all questions submitted to it by the Governor-General in Council.*

Lastly, when the sums in dispute exceed the value of £50,000, appeal may be interposed to the Privy Council. The Canadian law is the common law of England, that is to say, essentially monarchical. Nevertheless, some of the enactments of the English code have been modified by the federal parliament. In the province of Quebec, where the population is in great part French, the English criminal code has been introduced, but the civil law is almost entirely the same as prevailed in France before the Revolution. Thus the right of bequeathing property is unlimited, and fortunes are disposed of at the testator's pleasure without regard to the natural rights of his children.

RELIGION.—EDUCATION.

According to the Canadian constitution the separation of Church and State should be absolute in the Dominion. Thus neither the Catholic nor any of the Protestant cults derive any direct aid from the public revenues, receiving no grants of money except those that in certain cases are made to their schools. In Lower Canada, where the French and Irish Roman Catholics combined have an enormous preponderance, Protestants enjoy the free exercise of their religion. In the same way Catholics are treated with absolute tolerance by the Protestants of the other provinces, where Anglo-Saxons of diverse denominations are in the majority. The State recognises the right of all religious communities to constitute themselves in a distinct body for purposes of worship and instruction. Even the Jesuits have not only a legal status, but a portion of the property of which they were deprived in the last century has been restored to them. The religious organisation of the province of Quebec has been preserved such as it existed under the French rule, and the curés, or parish priests, still receive the

* N. Legendre, *Notre Constitution et nos Institutions*; Honoré Mercier, *Esquisse générale de la province de Québec*.

so-called "dime," or tithes, which, however, instead of being a tenth are scarcely a twenty-sixth part of the impost. Thanks to this tax they to a certain extent share in the administration of the province. The surplus of the ecclesiastical revenues passes in great measure to the convents and schools.

Primary instruction, obligatory in all the Canadian provinces, has not been uniformly regulated throughout the Dominion. Hence the questions associated with this subject are warmly discussed by the different sections of the community, because, in the provinces of mixed populations, they affect the interests of race, language, and religion. In Quebec, the oldest colonised province, the schools, with the exception of a few private establishments, are denominational, that is, some Catholic, some Protestant, not secular, neutral, or "godless." Catholicism being the religion of the great majority, more than six-sevenths of the children receive an education controlled or directed by the Catholic clergy. The Council that presides over the organisation of the schools comprises all the Catholic bishops of the province, ex-officio members, besides an equal number of laymen nominated by the Government. As a section of the lay members always sides with the bishops, the Roman Church completely controls all educational matters.

Its influence is strengthened from the fact that the secondary schools are also, for the most part, Catholic colleges or "convents," where instruction is given directly and almost exclusively by members of the clergy and of the sisterhoods. Lastly, the chief university, the oldest high school in the Dominion, is also a purely Catholic institution, and it is significant that divinity is its most numerous attended faculty.

But the Protestants on their part also enjoy the full right of organising their denominational schools after their own fashion. A Protestant committee, whose members are chosen by the Government, directs the schools and distributes the grants in aid. Moreover, the religious minority in each municipality has the power, whenever dissatisfied with the conduct of educational affairs, to appoint special syndics to watch over its interests. The inspectors of the schools of both denominations are themselves Roman Catholics and Protestants respectively. On an average the grants made by Government to the non-Catholic schools somewhat exceed those received by their rivals; but both confessions enjoy complete equality before the law. The same remark applies also to the two languages, for instruction is given in French where the children are of French origin or speech, and in English where the Anglo-Saxon and Irish elements prevail.

In the province of Ontario, where the Protestants have the numerical superiority, but where the Catholics form an important minority, the people have also their denominational schools. Nevertheless, most of the communes being controlled by the Protestants, many Canadian Catholics, instead of exercising their right to organise their own schools where both French and English would be taught, send their children to the establishments where instruction is imparted exclusively in English. In the eastern counties, however, near the St. Lawrence and Ottawa confluence, the French Canadians have the majority in certain municipalities, and are thus enabled to support schools where their language is predominant.

Hence arise frequent political conflicts, one party complaining that the teachers neglect the study of the language which is dominant in the province, the other claiming the constitutional right of conducting their schools in their own way. The opinion which seems to be gradually prevailing in Ontario is to give a purely secular character to the schools, and to make the study of the English language obligatory. This would be in accordance with the precedent already furnished by the province of Manitoba, where the same cause of dissension had arisen between the English Protestant and the French Catholic schools; and where the question was settled by making English the exclusive language of instruction. In 1890, the Manitoba parliament also decided, by a large majority, that the deliberations should henceforth be carried on in English alone.

In British Columbia and the Maritime Provinces education has long been secularised, and here religious instruction is now given only in the family circle and in the private establishments. The use of the French decimal system has been legalised and rendered optional in Canada; but it is little practised, although the American monetary system has been adopted.

FINANCE.

The public revenue required by Government for the general cost of the administration, civil service, army, law courts, and public instruction is derived mainly from the customs dues, which average about 15 per cent. on the value of all imported goods. The Dominion also possesses large domains, the annual sale of which, however, add but a very small sum to the national budget. Most of the lands now bought by intending settlers are obtained, not from the State, but from the powerful railway corporations.

As is the case with most other civilised governments, the expenditure generally exceeds the income, and the public debt, although trifling compared with that of England or France, already represents more than six years of revenue. The Canadian Budget increases far more rapidly than the population, having nearly doubled within a single decade, rising from £4,500,000 in 1878 to about £8,000,000 in 1888. Besides the national budget each province has its special revenue, expenditure and debt. Thus the indebtedness of the province of Quebec already approaches two millions sterling.

CONFEDERATION.

Since the recognition of the principle of colonial autonomy by Great Britain, the political condition of the Dominion has been diversely modified. The creation of the Confederacy may be said really to date from the year 1841, when Upper and Lower Canada were fused in a single state. But the other provinces still continued to hold aloof, and during this transitional period their only political connection with the two provinces of the Laurentian basin was that derived from their common dependence on England. The movement towards general amalga-

mation was not revived till the year 1867, and then four years were occupied with preliminary discussion and diplomatic negotiations before the various colonies were at last united in the "Dominion of Canada." At first the two Canadas, properly so called, together with Nova Scotia, Cape Breton, and New Brunswick, formed a federation. In 1869 the Hudson Bay Company sold its rights over the North-West Territories; in 1871 the Columbian region of the Pacific seaboard became a member of the Canadian "Greater Britain;" lastly, in 1873, the little Prince Edward Island, smallest of all the colonies, threw in its destinies with those of its powerful neighbours.

Newfoundland alone has hitherto declined to join the Confederacy. Nevertheless the negotiations connected with this subject have never been completely interrupted, while the economic alliance becomes more and more intimate. Meanwhile the Dominion prudently awaits the definite settlement of the thorny questions connected with the fisheries before taking further action.

In virtue of the constitution as set forth in the *British North America Act*, 1867 (30 Victoria, cap. 3), the executive government and supreme authority is vested in the Crown, the Queen being represented by a Governor-General appointed by her, but paid by the Dominion.

The "Queen's Privy Council for Canada," for which members of the Dominion Parliament are alone eligible, forms a ministry which must possess the confidence of the majority of the Lower House. But the power of dismissing the Privy Council is vested in the Governor-General.

An officer of the British Army, of rank not inferior to a major-general, appointed by the Crown and paid by Canada, has the supreme command of all the military forces both active and reserve.

Under the Act of Union the confederate government practically enjoys absolute control over all matters which by that Act are not specially delegated to the provincial parliaments. Thus it is empowered to make laws affecting the peace and general prosperity of the whole Dominion, and it reserves to itself the privilege of legislating on such questions as trade and commerce; indirect taxation; borrowing on the public credit; public debt and property; the postal service; the census and vital statistics of all kinds; lighthouse and coast service; militia and defence of the Dominion; navigation and shipping; fisheries; quarantine; currency and banking; weights and measures; bankruptcy and insolvency; the naturalisation of aliens; marriage and divorce; criminal law and procedure in criminal cases; penitentiaries.

On the other hand each member of the confederation has its own provincial assembly and administration, regulating its local affairs as specified in the Act of Union. Thus the provinces dispose of their own revenues, and legislate for their own welfare; but no laws can be enacted by them which might tend to interfere or clash with the legislation of the confederate parliament. They take cognisance of such questions as education; asylums, hospitals, charities and eleemosynary institutions; trading licences; prisons and reformatories; municipal affairs; local works; property and civil rights; administration of justice so far as

regards the appointment of magistrates or justices of the peace, and the constitution, maintenance, and organisation of provincial courts of civil and criminal jurisdiction.

But the provinces have not, like the States of the American federal union, the power to organise and maintain a provincial military force. Nor are the enactments of the provincial assemblies absolute, inasmuch as the Dominion Government reserves to itself the power of veto.

In general the Canadian constitution may be described as consisting of a representative government of ministers directly responsible to the people; a federal government having charge of the general weal, and provincial governments entrusted with the local and provincial interests.

The enormous advantage of complete autonomy in all matters peculiar to each province explains the political tranquillity of the confederation, and the good understanding which usually prevails between the various elements of the population. Doubtless the Dominion has also its causes of dissension and trouble. The native tribes in British Columbia and the North-West Territories have not yet been entirely assimilated, that is, brought into reserves, while the two successive rebellions of the Bois-Brulés (French-Canadian half-breeds) in Manitoba and Saskatchewan have shown how little the interests of this class have been reconciled with those of the new settlers. The heated debates on the subject of public instruction and the rival languages keep alive a strong party feeling in the several provinces. The lack of fertile lands and of convenient access to the markets of the world is severely felt in some districts, where emigration is beginning to assume the form of an exodus. Lastly, a still more ominous element of future danger lurks in the monopoly of the highways of traffic granted with perhaps too free a hand to the great railway companies and to the syndicates of speculators in various industries. Such a policy tends to revive the evils of the old Hudson Bay and other trading companies, threatening to stifle the spirit of individual enterprise and to reduce whole populations to a state of helpless servitude.

POLITICAL FORECASTS.

But, however grave may be the political and social problems which Canada will be called upon to deal with in the near future, they do not assume the same urgent and even threatening aspect as in the neighbouring republic. The formidable antagonism of races, which so largely contributed to bring about the War of Secession, and which still exists pregnant with tremendous issues for the Southern States, if not for the whole union, has no direct interest for Canada, which had already abolished slave labour at the beginning of the present century. Other ethnical and economic conflicts, growing out of the prodigious movement of immigration setting towards the United States, will have to be fought out in the Alleghany uplands and the valleys of the Mississippi; such conflicts can affect the Canadian provinces only in a secondary degree, at least until the wheat-growing regions of the Far West also begin to attract great streams of immigrants.

Lastly, the commercial monopoly of the land, the mines and industries, which threatens to render the justly-prized liberties of the American citizen a mockery and a delusion, is progressing at a far more rapid rate in the United States than in the confederate provinces of British North America.

Hence it is natural that most Canadians energetically resist the attraction of their powerful neighbour, towards which they might be supposed to be drawn by the ties of so many common interests, and even by the very geographical position of the conterminous states. During the War of American Independence bands of Franco-Canadian rebels, instigated by Lafayette, crossed the frontier to join the New England insurgents; but their action was not supported by the public opinion of their fellow countrymen, and the ministers of religion refused them burial in consecrated ground.*

Since that time American parties have been formed in Canada during all the great political crises, but their influence has always diminished, and the cry for annexation is now seldom heard. On the other hand many American statesmen, fearing that the annexation of the Canadian provinces might disturb the equilibrium of parties to their disadvantage, are equally opposed to union with the northern populations of the continent. Nevertheless, the general opinion in the States themselves appears to be that the Dominion will at last gravitate towards the great Anglo-Saxon republic, and orators at the Washington Congress are often heard dilating on the "manifest destiny," by which one day all the inhabitants of North America will be grouped in a single political state.

This question has been recently discussed by Mr. Charles Dudley Warner,† a thoughtful American writer, who generally concludes that in Canada there is at present "a growing feeling for independence, very little, taking the whole mass, for annexation." One reason for this he finds in the prevailing belief of Canadians that the Dominion is better governed than the republic. There is also a strong dislike felt for too frequent elections, for sensational and irresponsible journalism, and for the want of system and prevailing corruption in the civil service department. He considers that there are "great commercial forces at work, which seem strong enough to keep Canada for a long time in her present line of development in a British connection."

In order to strengthen this tendency and neutralise the attractive forces working in the opposite direction, some English statesmen have proposed the formation of an "Imperial Britain," to comprise in a single confederation of equal and autonomous states all the English colonies—the Canadian Dominion, Australasia, South Africa, perhaps India itself. But this political and commercial league, a sort of British *Zollverein*, would necessarily sacrifice the interests of the less powerful states. Canada especially might suffer from such a union, and might on that very account be drawn more irresistibly than ever towards the powerful conterminous republic. Many Canadians already ask, as they are not directly represented abroad by their own envoys, why they should continue to

* Philippe Aubert de Gaspé, *Les Anciens Canadiens*.

† *Studies in the South and West, with Comments on Canada*, 1890.

depend on Great Britain in the conduct of their foreign interests. They may possibly feel the irksomeness of the situation all the more that, since the overthrow of the Brazilian Empire, they will find themselves henceforth isolated in the New World by their semi-monarchical institutions.

But, however this be, no party or political group seems disposed to anticipate the natural course of events. Those even who believe the union to be inevitable still rely on destiny for its peaceful accomplishment. On neither side is there any standing army charged with the maintenance of peace by preparing for war. It is merely felt that in case of conflict the American republic will be able to appeal to the "last reason" summed up in the words "might is right." Her will must needs be accomplished, as it was accomplished when the questions of frontiers were decided in her favour all along the borders from Maine and Lake Champlain to Oregon and the Juan de Fuca Strait.

The most zealous of American "annexationists" will confine their efforts to preparing the way by a custom-house alliance, which they hope may gradually merge in political assimilation; nor can it be denied that there are many Canadians who might readily allow themselves to be seduced by the apparent commercial advantages of such a union.

In any case there is no perceptible difference of race, language, or literature between the Anglo-Saxon populations on either side of the political frontiers, while the differences in customs or institutions are either slight in themselves, or carry little weight in the presence of such momentous issues. For Americans and British Canadians alike the amalgamation would involve social and political changes of comparatively little importance.

With the French Canadians it is otherwise, differing as they do in religion, language, and aspirations from the surrounding Anglo-Saxon populations. For them annexation would necessarily be a serious event, and many of them naturally fear that it might ultimately lead to their total extinction as a separate people, just as most of their fellow-countrymen have already been absorbed in Louisiana. But they have already resisted so many assaults, they have thriven so vigorously under the most adverse circumstances and safeguarded their nationality in the midst of seemingly overwhelming difficulties and dangers, that they may perhaps contemplate the course of events with composure. Whatever political groups may in future be formed by the North American peoples, the French Canadians may still hope to enter the body politic as a free and distinct ethnical factor.

The Franco-Canadians themselves are, as a rule, loyal to the Crown of England, while maintaining the national spirit and hopeful of the future destinies of their race. The Hon. Honoré Mercier, a competent interpreter of Canadian feeling, remarks on this subject: "The liberties which we have conquered with the blood of some of our members enable us to retain under the British flag the customs, language, and civil laws of the France of Louis the Great, to openly proclaim ourselves French, without hindrance or molestation, to take a prominent part in the politics and destinies of the Canadian Confederation, and our fellow-citizens of English origin benefit too much by these liberties to think badly of us for

having introduced them into the country—we, the descendants of the autocratic France of Richelieu and Louis XIV. The extent and richness of our territory ; its natural resources, as inexhaustible as they are varied ; its incomparable geographical position, which enables it to command the trade of the richest portions of Canada and the Western States of the American Republic ; its great waterway of the St. Lawrence, the most important channel of inland and oceanic navigation which exists in the world ; its magnificent system of railways, which is rapidly extending ; its universities, colleges, convents, and its thousands of public schools, which furnish the people with education and instruction in all branches and degrees ; its numerous benevolent institutions for the relief of distress and infirmity ; its political institutions, which guarantee freedom to all citizens and the most absolute protection to all races and religious interests ; the perfect harmony which reigns among the different groups of its population—in fine, the result of all these benefits and advantages will be that, in the near future, our province will offer the spectacle of a great people rich, happy, and prosperous ; and as all these things will be achieved in a large measure by that French-Canadian population whom Providence seems to have selected as the special instrument of its inscrutable designs, the future writer of the history of this beautiful country may, with reason, take for the epigraph of his book, *Gesta Dei per Francos*.”*

* *General Sketch of the Province of Quebec, 1889.*





APPENDIX I

STATISTICAL TABLES.

GENERAL.

				Square miles.
Area of North America without the Islands . . .				7,927,000
,, South America ,, ,, . . .				7,093,000
,, Central America . . .				219,000
,, Islands and Greenland . . .				1,490,000
Total . . .				16,729,000
				Miles.
Coastline of North America, without the Islands . . .				27,500
,, South ,, ,, ,, . . .				21,250
				Miles.
Area of America and adjacent Islands north of the equator . . .				10,890,000
,, ,, ,, south ,, . . .				5,839,000
Total . . .				16,729,000
				Area in square miles.
Anglo-Saxon America . . .				7,193,000
Latin America . . .				9,536,000
				Population
Anglo-Saxon America . . .				68,000,000
Latin America . . .				48,000,000
				Whites and Half-Breeds.
Anglo-Saxon America . . .				60,000,000
Latin America . . .				31,000,000
				Coloured.
Anglo-Saxon America . . .				7,500,000
Latin America . . .				15,000,000
				Aborigines.
Anglo-Saxon America . . .				500,000
Latin America . . .				2,000,000
Totals . . .				116,000,000
				Total.
Totals . . .				116,000,000

GREENLAND.

Probable area (Behm and Wagner) 868,000 square miles.

Population of the explored coastlands :—

Inspectorate of North Greenland (1886)	. . . . .	4,414
„ South Greenland (1882)	. . . . .	5,484
Eastern Territory (1884)	. . . . .	548
Total	. . . . .	10,446

Vital statistics of Danish Greenland (1882) : Births, 335 ; deaths, 401.
Average annual yield of the Greenland fisheries, from 1870 to 1877 : common seals (*phoca fatida*), 51,000 ; other seals, 37,000 ; walruses, 200 ; whales and narwhals, 703 ; cod, 200,000.
Books published in Greenlandish down to 1874 : religious works, 25 ; school books, 16 ; literary, 16 ; total, 57.

TRADE (1885).

Imports from Denmark	. . . . .	£27,600
Exports to „	. . . . .	33,250

ADMINISTRATIVE DIVISIONS.

SOUTH GREENLAND.		NORTH GREENLAND.
Julianahaab.		Egedesminde.
Frederickshaab.		Kristianshaab.
Godthaab.		Jacobshavn.
Sukkertoppen.		Godhavn.
Holstenborg.		Ritenbenk.
		Umanak.
EAST GREENLAND.		Upemvik.
(No Divisions.)		

POLAR ARCHIPELAGO.

Approximate area	. . . . .	720,000 square miles.
Total population	. . . . .	2,000 to 3,000 Eskimo.

GEOGRAPHICAL DIVISIONS.

Main Groups.	Sub-Groups.
NORTH-EAST ARCHIPELAGO	Grinnell Land (Grant Land, &c.).
	Elleemere Land (North Lincoln, &c.).
	North Devon (Tujan).
	Grinnell Island.
	North Cornwall
	Cornwallis Island.
NORTHERN ARCHIPELAGO.	Bathurst Island.
	Finlay Island.
	Byam Martin Island.
	Melville Island.
	Prince Patrick Island.
	Eglinton Island.
	Parry Group.

Main Groups.	Sub-Groups.
SOUTH-EAST ARCHIPELAGO.	Baffin Land with Colburn and Penny Lands.
	Fox Land, Meta Incognita (Kingnait), &c.
	Bylot Island (Possession Island, Uivang).
	Resolution Island (Tujakjuak).
	Melville Peninsula.
WESTERN ARCHIPELAGO.	North Somerset Island.
	Boothia Felix Peninsula.
	King William's Land.
	Prince of Wales.
	Prince Albert Land (Wollaston and Victoria Lands).
	Banks Land, including Baring Land.

ALASKA.

Area : 531,410 square miles. Population (1870) : 70,640 ; (1880) 33,620.
 Coast-line, without the islands and small inlets : 7,900 miles.
 Area of the Aleutian Islands : 5,830 square miles.
 Area of the Alaskan Islands north of the Aleutians : 4,120 square miles.

POPULATION OF ALASKA ACCORDING TO RACES (1880) :—

Eskimo	17,617
Aleutians	2,145
Tinneh Indians	3,927
Thlinkits	6,763
Whites	430
Creoles (Half-Breeds)	1,756
Total	32,638 (Ivan Petroff's estimate).

ANNUAL SLAUGHTER OF FUR-BEARING SEALS : Pribilof Islands, 100,000 ; Bering and Copper Islands, 25,000 ; Crozet Islands (Indian Ocean), 1,500 ; New Shetland and Falkland Islands, 5,000.

Fur-bearing seals in the Pribilof Islands :—

	St. Paul.	St. George.	Total.
Family groups	3,030,250	163,420	3,193,000
Bachelors	1,400,000	100,000	1,500,000
Totals	4,430,250	263,420	4,693,000

ANNUAL REVENUE OF THE FUR COMPANY :—

Otter skins	106,500	value	£100,000
Other peltries	56,500	„	29,000
Total	163,000	„	£129,000

Cod exported to California from the Alaskan and Okhotsk seas (1887) : 1,129,000.

Annual value of the Alaskan whale fisheries : £237,000, or about £5,900 per vessel.

Annual value of the Alaskan gold-mines : (1882) £30,000 ; (1886) £93,000.

DOMINION OF CANADA.*

AREA AND POPULATION FROM LAST OFFICIAL RETURN (1881).

	Area in square miles.	Males.	Females.	Total Population.
NORTH-WEST TERRITORY AND ARCTIC ISLANDS.	Assiniboia	28,113	28,333	56,446 (1881)
	Saskatchewan			
	Alberta			
	Athabasca			
	Keewatin			
	Great North			
PROVINCES.	British Columbia	29,503	19,956	49,459
	Manitoba	37,207	28,747	65,954
	Ontario	976,461	946,767	1,923,224
	Quebec	678,109	680,918	1,359,027
	New Brunswick	164,119	157,114	321,233
	Nova Scotia	220,538	220,034	440,572
	Prince Edward Island	54,729	54,162	108,891
		3,648,527	2,188,779	4,324,810
	Newfoundland	—	—	197,335 (1884)
	Total Br. N. America	3,688,727	—	4,522,145

Probable population, 1890 (with Newfoundland) : 5,500,000.

POPULATION ACCORDING TO CREEDS :—

Roman Catholics	1,791,982
Methodists	742,981
Presbyterians	676,165
Anglicans	574,818
Baptists	296,525
Lutherans	46,350
Congregationalists	26,900
Miscellaneous	79,686
Of "no religion"	2,634
No creed stated	86,769 *
Total	4,324,810

ADULTS CLASSED ACCORDING TO OCCUPATIONS :—

Agriculturists	662,630—about 56 per cent.
Artisans, labourers	287,295 „ 24 „
Trades	107,649 „ 9 „
Servants	74,830 „ 7 „
Professions	52,974 „ 4 „

POPULATION ACCORDING TO RACES AND NATIONALITIES :—

Franco-Canadians (French descent)	1,299,161
British Canadians {	Irish 957,403
	English 881,301
	Scotch 669,863
British-born	470,092
British Americans	77,753
German descent	254,319
German-born	25,328
Dutch descent	30,412
French-born	4,389
Russians or Russo-Germans	6,376
Indians	132,000
Coloured (African descent)	21,394
Chinese	4,383
Scandinavians, Italians, and others	66,000

* The Statistics in these Tables are the latest available to date.

IMMIGRANTS :—

1878	40,000	1884	166,000
1879	61,000	1885	105,000
1880	86,000	1886	122,000
1881	117,000	1887	175,000
1882	193,000	1888	174,000
1883	207,000		

GROWTH OF POPULATION DURING THE PRESENT CENTURY :—

1806	456,000	1861	3,323,000
1834	1,303,000	1871	3,602,000
1844	1,803,000	1881	4,325,000
1851	2,547,000	1890	5,500,000 (P)

GROWTH OF FOREIGN TRADE FROM 1880 to 1889.

Year.	Total Exports.	Total Imports.
1880	£17,000,000	£17,000,000
1881	19,000,000	21,000,000
1882	18,000,000	16,000,000
1883	39,000,000	26,000,000
1884	18,000,000	23,000,000
1885	18,000,000	22,000,000
1886	17,000,000	21,000,000
1887	18,000,000	22,000,000
1889	18,000,000	24,000,000

CHIEF EXPORTS AND IMPORTS (1887).

Exports.	Value.	Imports.	Value.
Lumber and other forest products	£4,100,000	Iron, steel, and hardware	£2,740,000
Wheat and wheat flour	1,400,000	Coal and coke	1,380,000
Cheese	1,420,000	Bread stuffs	1,420,000
Barley	1,050,000	Cotton and cotton-stuffs	1,100,000
Horned cattle	1,300,000	Tea and coffee	743,000
Horses	454,000	Sugars	1,127,000
Sheep	320,000	Cotton wool and waste	616,000
Eggs	361,000	Drugs and chemicals	280,000
Other agricultural produce	1,300,000	Silk and silken stuffs	540,000
Codfish	510,000	Provisions	354,000
Other kinds of fish	870,000	Wool, raw	375,000
Coal	304,000	Hides, raw	392,000
Gold-bearing quartz and nuggets	204,000	Leather and leather ware	337,000
Other mineral articles	253,000	Tobacco, unmanufactured	265,000
Wood and wooden wares	115,000	Wood and wooden wares	285,000
Iron, steel, and hardware	70,000	Live-stock	335,000
Leather and leather ware	116,000	Flax, hemp	305,000
Coin and bullion	1,100	Wines and spirits	286,000
Sundries	1,040,000	Coin and bullion	106,000
Foreign produce	1,710,000	Sundries	580,000
Wool and woollen stuffs	2,580,000		

GROWTH OF TRADE WITH GREAT BRITAIN.

Year.	Exports to.	Imports from.
1878	£8,874,000	£7,000,000
1880	12,930,000	5,040,000
1882	9,871,000	7,959,000
1884	10,388,000	8,592,000
1886	10,061,000	7,547,000
1887	10,267,000	7,746,000
1889	9,270,000	10,850,000
Grain and flour exported to Great Britain (1887)		2,582,000
Wood and timber	" "	2,727,000
Cheese	" "	1,555,000
Live-stock	" "	1,221,000
Fish	" "	278,000
Butter	" "	140,000

APPENDIX I.

GROWTH OF TRADE WITH GREAT BRITAIN—continued.

Woollen stuffs	imported from Great Britain (1887)	£1,706,000
Iron wrought and unwrought	" " " "	1,488,000
Cotton goods	" " " "	1,018,000
Clothes, haberdashery, &c.	" " " "	690,000
Total imports from the United States (1889)	.	£11,547,000
" exports to	" " " "	8,855,000

BUDGET FOR THE TWENTY YEARS ENDING 1888.

Year.	Revenue.	Expenditure.	Public Debt.
1868	£2,700,000	£2,700,000	£19,000,000
1869	2,800,000	2,800,000	22,000,000
1870	3,100,000	2,800,000	23,000,000
1871	3,800,000	3,100,000	23,000,000
1872	4,100,000	3,500,000	24,000,000
1873	4,200,000	3,800,000	26,000,000
1874	4,800,000	4,600,000	28,000,000
1875	4,900,000	4,700,000	30,000,000
1876	4,500,000	4,900,000	32,000,000
1877	4,400,000	4,700,000	35,000,000
1878	4,400,000	4,700,000	35,000,000
1879	4,500,000	4,900,000	36,000,000
1880	4,600,000	4,900,000	39,000,000
1881	5,900,000	5,100,000	40,000,000
1882	6,600,000	5,400,000	41,000,000
1883	7,100,000	5,700,000	40,000,000
1884	6,300,000	6,200,000	48,000,000
1885	6,500,000	7,100,000	53,000,000
1886	6,600,000	7,800,000	54,000,000
1887	7,100,000	7,100,000	54,000,000
1888	7,200,000	7,300,000	57,000,000

EXPORT OF BREAD STUFFS, 1878—1888.

Year.	Wheat. bush.	Flour. barrels.	Barley. bush.	Maize. bush.	Other grains. bush.	Other Bread stuffs. lbs.
1878	8,509,000	479,000	7,543,000	3,987,000	5,380,000	38,200,000
1879	9,767,000	580,000	5,393,000	5,429,000	5,936,000	25,774,000
1880	12,170,000	561,000	7,241,000	4,547,000	9,622,000	32,458,000
1881	9,092,000	501,000	8,800,000	5,257,000	8,154,000	20,893,000
1882	6,433,000	508,000	11,588,000	2,230,000	9,235,000	17,096,000
1883	10,733,000	526,000	8,817,000	819,000	4,704,000	17,661,000
1884	3,021,000	584,000	7,780,000	3,806,090	4,736,000	20,354,000
1885	5,424,000	161,000	9,067,000	2,007,000	5,619,000	22,127,000
1886	5,706,000	415,000	8,554,000	2,667,000	7,851,000	29,624,000
1887	9,127,000	531,000	9,456,000	3,373,000	6,415,000	23,289,000
1888	7,300,000	355,000	9,370,000	1,203,000	2,816,000	12,386,000

DOMINION LANDS.

Year.	Area sold. acres.	Amount realised.
1873	155,600	£5,700
1874	334,700	6,000
1875	156,700	5,000
1876	133,000	1,700
1877	429,000	28,700
1878	709,000	27,600
1879	1,096,000	51,000
1880	682,000	32,000
1881	1,057,000	33,000
1882	2,700,000	365,000
1883	1,832,000	185,000
1884	1,110,000	157,000
1885	482,000	57,000
1886	575,000	64,000
1887	521,700	82,000
1888	679,000	81,000

Land under cultivation (1871): 17,336,000 acres; (1881) 21,900,000 acres.

PROGRESS OF SOME OF THE CHIEF TOWNS BETWEEN THE YEARS 1881 AND 1888.

Towns.	Population.		Assessment. 1888.	Municipal Debt. 1888.
	1881.	1883.		
Montreal	140,000	200,000	£21,800,000	£2,100,000
Toronto	77,000	166,000	20,000,000	1,900,000
Hamilton	35,000	43,000	4,000,000	500,000
London	19,000	27,000	2,400,000	430,000
Ottawa	25,000	40,000	2,800,000	490,000
Halifax	36,000	40,000	4,300,000	—
Winnipeg	6,000	22,000	3,900,000	68,000
St. Thomas	9,000	10,000	770,000	47,000
Charlottetown	11,000	—	737,000	52,000
Sherbrooke	7,000	9,000	580,000	32,000
Guelph	10,000	10,000	635,000	89,000
Brantford	10,000	13,000	1,010,000	52,000
St. Catherine's	9,000	10,000	940,000	30,000
Peterboro'	6,000	8,000	758,000	37,000
Windsor	6,000	8,000	537,000	51,000
Cornwall	4,000	6,000	270,000	16,000
Collingwood	4,000	5,000	267,000	16,000
Cobourg	5,000	4,000	312,000	48,000
Lindsay	5,000	5,000	345,000	33,000
Galt	5,000	7,000	360,000	21,000
Barrie	4,000	5,000	263,000	15,000
Brockville	7,000	8,000	681,000	16,000
Woodstock	5,000	8,000	457,000	28,000
Port Hope	5,000	5,000	300,000	38,000
St. John, N. B. . . .	26,000	—	3,805,000	559,000
Quebec. No returns.				

RAILWAY TRAFFIC, 1875-89.

Year.	Miles open.	Passengers	Freight. tons.	Earning.
1875	4,826	5,190,000	5,670,000	£3,900,000
1876	5,157	5,544,000	6,331,000	3,800,000
1877	5,574	6,073,000	6,859,000	3,700,000
1878	6,143	6,444,000	7,883,000	4,100,000
1879	6,484	6,523,000	8,348,000	3,900,000
1880	6,891	6,462,000	9,938,000	4,700,000
1881	7,260	6,943,000	12,065,000	5,600,000
1882	7,530	9,352,000	13,575,000	6,600,000
1883	8,726	9,580,000	13,266,000	6,700,000
1884	9,575	9,982,000	13,712,000	6,400,000
1885	10,150	9,672,000	14,659,000	6,500,000
1886	10,697	9,861,000	15,670,000	6,600,000
1887	11,691	10,698,000	16,356,000	7,700,000
1888	12,163	11,416,000	17,173,000	8,400,000
1889	13,000	12,000,000	17,400,000	8,900,000

Cost of construction of the Canadian Railways: £152,000,000 or about £7,400 per mile.

Pacific Railway. 1889: 6,400 miles open.

Capital invested: £39,500,000.

MINERAL PRODUCTIONS OF CANADA, 1887.

	Value.
Antimony Ore	585 tons £2,200
Arsenic	30 „ 240
Asbestos	4,619 „ 4,500
Baryta	400 „ 500

APPENDIX I.

MINERAL PRODUCTIONS OF CANADA, 1887—continued.

		Value.
Building Stone . . .	262,000 cubic yds.	£110,000
Chromic Iron Ore . . .	38 tons	110
Coal and Coke . . .	2,419,000 tons	979,000
Copper	3,260,000 lbs.	70,000
Gold	66,270 ozs.	233,000
Graphite	21,217 tons	28,000
Gypsum	154,000 „	31,000
Iron	31,500 „	217,000
Iron Ores	76,300 „	29,000
Lead	205,000 lbs.	2,000
Lime	2,269,000 bushels	79,000
Manganese	1,245 tons	8,700
Mica	22,000 lbs.	5,900
Petroleum	764,000 barrels	119,000
Phosphate	23,690 tons	64,000
Pig-iron	24,820 „	73,000
Platinum	1,400 ozs.	1,120
Pyrites	38,000 tons	32,000
Salt	60,170 „	33,000
Silver	—	68,000
Slate	7,350 tons	18,000
Steel	7,320 „	66,200
Sulphuric Acid	5,477,000 lbs.	14,000
Miscellaneous	—	400,000

OUTPUT OF COAL IN NOVA SCOTIA AND BRITISH COLUMBIA IN TONS.

Year.	Nova Scotia.	British Columbia.	Total.
1874	977,000	81,000	1,058,000
1875	875,000	110,000	985,000
1876	795,000	139,000	934,000
1877	848,000	154,000	1,002,000
1878	863,000	171,000	1,034,000
1879	883,000	241,000	1,124,000
1880	1,156,000	268,000	1,424,000
1881	1,259,000	228,000	1,487,000
1882	1,530,000	282,000	1,812,000
1883	1,593,000	213,000	1,806,000
1884	1,556,000	394,000	1,950,000
1885	1,514,000	365,000	1,879,000
1886	1,683,000	326,000	2,009,000
1887	1,871,000	413,000	2,284,000

YIELD OF THE CANADIAN FISHERIES BY PROVINCES.

Year.	Ontario.	Quebec.	Nova Scotia.	New Brunswick.	Manitoba and Territories.	British Columbia.	Prince Edward Island.	Total.
1876	£87,000	£420,000	£1,200,000	£390,000	£6,000	£21,000	£99,000	£2,200,000
1877	88,000	512,000	1,105,000	424,000	5,000	116,000	132,000	2,400,000
1878	69,000	533,000	1,226,000	461,000	—	185,000	170,000	2,600,000
1879	73,000	564,000	1,150,000	511,000	—	126,000	380,000	2,700,000
1880	89,000	526,000	1,260,000	549,000	—	142,000	335,000	2,900,000
1881	102,000	550,000	1,243,000	586,000	—	291,000	391,000	3,100,000
1882	165,000	395,000	1,426,000	638,000	—	368,000	371,000	3,300,000
1883	205,000	427,000	1,538,000	637,000	—	329,000	254,000	3,400,000
1884	226,000	339,000	1,752,000	746,000	—	271,000	217,000	3,500,000
1885	270,000	344,000	1,456,000	801,000	—	213,000	258,000	3,500,000
1886	280,000	348,000	1,683,000	836,000	37,000	315,000	228,000	3,700,000
1887	306,000	354,000	1,676,000	712,000	26,000	395,000	207,000	3,600,000
1888	368,000	372,000	1,563,000	588,000	36,000	380,000	175,000	3,500,000

GOVERNMENT EXPENDITURE FOR THE TWENTY-ONE YEARS ENDING 1888.

Year.	Railways.	Canals.	Other Public Works.
1868 . . .	£96,000 . . .	£26,000 . . .	£40,000 . . .
1869 . . .	56,000 . . .	25,000 . . .	35,000 . . .
1870 . . .	340,000 . . .	21,000 . . .	52,000 . . .
1871 . . .	590,000 . . .	27,000 . . .	112,000 . . .
1872 . . .	1,120,000 . . .	60,000 . . .	240,000 . . .
1873 . . .	1,152,000 . . .	76,000 . . .	250,000 . . .
1874 . . .	800,000 . . .	250,000 . . .	334,000 . . .
1875 . . .	1,003,000 . . .	343,000 . . .	343,000 . . .
1876 . . .	900,000 . . .	478,000 . . .	400,000 . . .
1877 . . .	642,000 . . .	826,000 . . .	255,000 . . .
1878 . . .	530,000 . . .	770,000 . . .	176,000 . . .
1879 . . .	500,000 . . .	610,000 . . .	150,000 . . .
1880 . . .	1,220,000 . . .	424,000 . . .	148,000 . . .
1881 . . .	1,100,000 . . .	420,000 . . .	214,000 . . .
1882 . . .	1,030,000 . . .	334,000 . . .	217,000 . . .
1883 . . .	2,340,000 . . .	370,000 . . .	310,000 . . .
1884 . . .	2,820,000 . . .	373,000 . . .	533,000 . . .
1885 . . .	2,250,000 . . .	312,000 . . .	448,000 . . .
1886 . . .	900,000 . . .	265,000 . . .	114,000 . . .
1887 . . .	654,000 . . .	372,000 . . .	510,000 . . .
1888 . . .	563,000 . . .	237,000 . . .	776,000 . . .

SAVINGS BANKS RETURNS PER PROVINCE FOR 1888.

Province.	Depositors.	Amount deposited.	Average Amount of each Depositor.
Ontario . . .	83,063 . . .	£3,257,000 . . .	£39 4 0 . . .
Quebec . . .	15,315 . . .	757,000 . . .	49 8 0 . . .
Nova Scotia . . .	1,402 . . .	36,000 . . .	25 9 0 . . .
New Brunswick . . .	1,062 . . .	40,000 . . .	38 4 0 . . .
Manitoba and N. W. } Territories . . . }	16 . . .	300 . . .	18 6 0 . . .
British Columbia . . .	835 . . .	46,000 . . .	55 0 0 . . .
Total	101,693 . . .	£4,136,300 . . .	Average £41 12 0 . . .

NEWSPAPERS PUBLISHED IN CANADA AND NEWFOUNDLAND (1886):— 788, of which 77 French,
nearly all the rest English.

FINANCE:—

Revenue (1889)	£7,940,000
Expenditure (1889)	7,636,000
Surplus	£304,000
Public debt of Canada, July 31, 1889	£49,320,000
Customs receipts (1888)	4,600,000
Military expenditure (1888)	265,000

NEWSPAPERS.

	1887.	1888.
Daily	87	89
Tri-weekly	10	9
Semi-weekly	17	20
Weekly	516	542
Bi-weekly	4	2
Semi-monthly	14	11
Monthly	74	82
Quarterly	1	—
Total of all issues	723	755

APPENDIX I.

PARLIAMENTARY REPRESENTATION UNTIL 1891.

Provinces.	House of Commons. Members.	Senate. Members
Ontario	92	24
Quebec	65	24
Nova Scotia	21	10
New Brunswick	19	0
Prince Edward Island	6	4
British Columbia	6	3
Manitoba	5	3
Total	214	78

COMPARATIVE TABLE OF THE CANADIAN LAKES.

Lakes.	Length in miles.	Breadth in miles.	Dep'th in feet.	Elevation in feet.	Area in sq. miles.
Superior	420	170	1,000	600	31,500
Michigan	320	70	700	576	22,400
Huron	280	105	1,000 (?)	574	21,000
Erie	240	57	200	565	9,000
Ontario	180	55	600	235	5,400
Winnipeg	280	57	—	710	8,500
Manitoba	120	24	—	752	1,900
Cedar	—	—	—	770	312
Dauphin	—	—	—	700	170
Winnipegosis	120	27	—	770	1,936
Great Slave	300	60	650	—	10,000.
Great Bear	150	140	—	—	14,000
Athabasca	230	14	—	620	3,500

BRITISH COLUMBIA.

Area : 341,305 sq. miles ; population (1881) : 49,459.
Yield of the Cassiar gold-mines : (1874) £208,000 ; (1887) £2,600.
Total yield of the British Columbian gold-mines (1888) : £128,000.
" " " coal " " 489,000 tons ; value, £500,000.
" " " fisheries (1887) £1,000,000.
Salmon tinned (1889) : 420,300 tins.
Total value of the salmon fisheries (1889) : £500,000.
Men employed on the British Columbian fisheries (1887) : 4,693.

EXCHANGES OF VICTORIA (1888) :—

Imports	£638,000
Exports	437,000
Total	£1,075,000

EDUCATIONAL STATISTICS OF BRITISH COLUMBIA IN 1887.

		Pupils.	Boys.	Girls.	Average Attendance.
Public schools	79	2,413	1,289	1,124	1,322
Graded schools	10	2,766	1,486	1,280	1,494
High schools	3	166	68	98	105
Total	92	5,345	2,843	2,502	2,921

Shipping of Victoria (1888) : 2,637 vessels, of 1,695,278 tons.
Shipping of the Port of Nanaimo (1888) : 11 vessels, of 575,182 tons.
Shipping of the Port of Vancouver (1889) :—

	Tons.
Foreign vessels entered and cleared	560, of 640,000
Coasting vessels	751 steamers ,, 409,254
" "	63 sailing-vessels ,, 10,587
Total	1,394 vessels, of 1,059,841

CHIEF TOWNS OF BRITISH COLUMBIA (1889).

	Population.		Population.
Victoria (3,270 in 1881)	16,000	Wellington	2,500
Vancouver	12,000	Yale	2,000
New Westminster	6,000	Kamloops	1,500
Nanaimo	3,000		

TERRITORIES OF THE GREAT NORTH.

Area : 2,060,000 square miles ; population : 15,000.

Peltries supplied to the London market (1887) :—

Musquash (Musk Rats)	2,485,368
Skunks	682,794
Foxes, &c.	513,291
Hares	114,824
Beavers	104,279
Martens	98,342
Bears	15,942
Wolverines	15,525
Lynxes	14,520
Otters	14,439
Fur-bearing Seals	13,478
Sundries	26,265
Total	4,099,067

WINNIPEG REGIONS.

AREAS AND POPULATIONS.

Provinces.	Area in sq. miles.	Pop., 1881.	Pop., 1899.
Manitoba	60,520	65,964	130,000
Saskatchewan	114,000		15,000
Athabasca and Alberta	222,000	42,000	20,000
Assiniboia	95,000		30,000
Keewatin	335,000		8,000
Total	826,520	107,964	203,000

Indians of the Hudson Bay slope (1884) : 24,984.

Indians of the whole region between the Rocky Mountains, Hudson Bay, and the United States (1881) : 49,472.

IMMIGRANTS INTO THE WINNIPEG REGIONS (1881).

From the Eastern Provinces of the Dominion	21,514
From Europe	4,321
From the United States	7,758

Total 28,593

Mean annual Immigration : 10,000 to 25,000.

POPULATION OF MANITOBA ACCORDING TO RACES.

	1881.	1886.	1899.
English	11,503	25,949	85,000
Scotch and half-breeds	16,506	25,676	
Irish	10,175	21,180	
French Canadians	9,949	{ 6,311 }	16,000
French half-breeds		{ 4,869 }	
Germans and Mennonites	8,652	11,082	13,000
Icelanders	—	2,468	8,000
Norwegians, Dutch, and Russians	2,412	1,189	2,000
Indians	6,767	5,578	5,000
Sundries	2,422	711	1,000
Total	65,964	108,640	130,000

GRAIN CROPS IN MANITOBA.

Total land under cereals in Manitoba (1889)	.	.	.	.	.	840,000 acres.
Wheat crop	"	"	.	.	.	11,000,000 bushels.
Other grains	"	"	.	.	.	8,500,000 "
Total value of grain crop	.	.	.	.	.	£2,000,000.

GROWTH OF AGRICULTURE IN ASSINIBOIA, SASKATCHEWAN AND ALBERTA.

	Year 1881.	Year 1885.	Increase.
Horses and mules	10,870	24,456	13,586
Working oxen	3,334	5,949	2,615
Milch cows	3,848	11,030	7,182
Other horned cattle	5,690	69,557	63,867
Sheep	346	19,398	19,052
Pigs	2,775	22,542	19,767
Home-made butter, lbs.	70,717	510,191	439,474
" cheese "	1,060	10,270	9,210
Wheat, acres	5,678	67,255	61,577
Barley "	—	11,605	11,605
Oats "	—	35,343	35,343
Potatoes "	811	3,676	2,865
Hay "	—	428	428

CHIEF TOWNS OF THE WINNIPEG REGIONS:—

	Pop., 1889.
Winnipeg	25,000
Brandon	4,800
La Prairie Portage	3,000
Selkirk	2,500
Calgary (Alberta)	2,500
Regina	2,000
Emerson	1,500
Medicine-Hat (Assiniboia)	1,500
Edmonton	1,200
Prince Albert (Saskatchewan)	1,000

THE LAURENTIAN BASIN: CANADA PROPER.

PROVINCES OF ONTARIO AND QUEBEC.

AREAS AND POPULATIONS.

	Area in sq. miles.	Population, 1881.
Ontario	181,800	1,923,224
Quebec	188,688	1,359,027
Totals	370,488	3,282,251

HYDROGRAPHY OF THE LAURENTIAN BASIN:—

Length of the St. Lawrence from the sources of the St. Louis River to Gaspé	miles	1,940
Length of St. Lawrence from Lake Ontario to Quebec	"	440
Area of the basin above Quebec	square miles	460,000
Approximate discharge of the St. Lawrence, according to Clarke	cubic feet	890,000
Approximate discharge of the St. Lawrence, according to the Geological Commission	cubic feet	1,130,000
Navigable highway from Belle-Isle to Montreal	miles	1,150
Total navigation of the river and lakes from Belle-Isle to Duluth	"	2,380

ORIGIN OF THE FRENCH AND OTHER SETTLERS IN CANADA IN THE 17TH CENTURY:—

Paris	358	Brittany	87
Charente	348	Other parts of North and Central France	474
Normandy	341	South France	34
Poitou	239	Foreigners	26
Flanders and Picardy	95		
		Total	2,002

GROWTH OF THE FRENCH-CANADIAN POPULATION UNDER BRITISH RULE:—

1774	98,000	1881	1,293,929
1871	1,005,200	1889	1,490,000

GROWTH OF POPULATION IN THE TWO PROVINCES:—

	1842.	1861.	1871.	1881.	1890 (est.).
Ontario	487,000	1,396,000	1,621,000	1,923,000	2,250,000
Quebec	697,000	1,111,000	1,192,000	1,359,000	1,580,000

Yearly births in the Franco-Canadian population	80,000
„ deaths „ „ „	37,000

Increase of natural growth 43,000

French-speaking population of Canada (1889)	1,490,000
French Canadians in the United States	600,000

Total French Canadians in N. America 2,090,000

ADMINISTRATIVE DIVISIONS OF QUEBEC.

Counties.	Area in square miles.	Population, 1881.	Counties.	Area in square miles.	Population, 1881.
Argenteuil	970	16,060	Megantic	770	19,000
Athabasca	512	20,120	Missisquoi	370	17,780
Assumption	257	15,280	Montcalm	5,000	12,960
Bagot	350	21,200	Montmagny	640	15,260
Beauce	1,900	32,000	Montmorency	2,220	12,320
Beaucharnois	140	16,000	Montreal (City)	5	140,700
Bellechasse	696	18,000	Napierville	158	10,500
Berthier	2,510	21,840	Nicolet	610	26,600
Bonaventure	3,600	18,900	Ottawa	6,900	49,430
Brome	480	15,830	Pontiac	21,800	20,000
Chambly	140	10,860	Portneuf	1,730	25,170
Champlain	9,480	26,820	Quebec (City)	12	62,440
Charlevoix	2,000	17,900	Quebec (County)	2,750	20,280
Châteauguay	260	14,400	Richelieu	200	20,220
Chicoutimi	17,000 (?)	25,000	Richmond	560	13,190
Compton	1,430	19,850	Rimouski	5,100	35,790
Deux Montagnes	266	15,850	Rouville	255	18,550
Dorchester	940	18,710	Saguenay	80,000 (?)	7,460
Drummond	645	17,240	St. Hyacinth	280	20,630
Gaspé	4,700	25,000	St. John	180	12,260
Hochelaga	85	40,000	St. Maurice	2,600	12,980
Huntingdon	410	15,500	Shefford	570	23,230
Iberville	196	14,460	Sherbrooke	230	12,220
Islet (L')	800	14,920	Soulanges	140	10,200
Jacques Cartier	110	12,340	Stanstead	400	15,550
Joliette	3,770	22,000	Temiscouata	1,900	25,480
Kamouraska	1,000	22,180	Terrebonne	560	21,890
Laprairie	180	11,430	Three Rivers (Town)	18	9,300
Laval	90	9,460	Vaudreuil	190	11,480
Lévis	265	27,980	Verchères	200	12,450
Lotbinière	745	20,800	Wolfe	680 (?)	13,150
Maskinongé	3,350	17,500	Yamaska	270	17,000

ROMAN CATHOLICS IN THE PROVINCE OF QUEBEC (1881):—

French	1,075,130
Irish	123,749
Total	1,198,879

PUBLIC INSTRUCTION IN THE PROVINCE OF QUEBEC (1887):—

	Catholic.	Protestant.	Total.
Elementary Schools	3,586	988	4,584
Higher	570	80	650
Attendance	221,611	33,648	255,259

ADMINISTRATIVE DIVISIONS OF ONTARIO.

Counties.	Area in square miles.	Population, 1881.	Counties.	Area in square miles.	Population, 1881.
Glengarry	480 . . .	22,220	Cardwell	393 . . .	16,770
Cornwall	105 . . .	9,900	Welland	266 . . .	26,152
Stormont	317 . . .	13,290	Niagara	40 . . .	3,445
Dundas	395 . . .	20,600	Monck	386 . . .	17,145
Prescott	507 . . .	22,860	Lincoln	174 . . .	22,965
Russell	710 . . .	25,080	Haldimand	370 . . .	18,620
Ottawa (capital)	3 . . .	27,410	Wentworth, South	230 . . .	14,995
Grenville, South	237 . . .	13,526	Wentworth, North	235 . . .	16,000
Grenville, North	370 . . .	12,930	Halton	364 . . .	21,920
Carleton	670 . . .	24,690	Wellington, South	370 . . .	25,400
Brockville	126 . . .	12,514	Wellington, Central	373 . . .	22,265
Leeds, North	670 . . .	22,206	Wellington, North	580 . . .	25,870
Lanark, South	627 . . .	20,030	Grey, South	464 . . .	21,130
Lanark, North	632 . . .	13,945	Grey, East	800 . . .	29,668
Renfrew, South	4,230 . . .	19,160	Grey, North	595 . . .	23,334
Renfrew, North	12,800 . . .	20,960	Norfolk, South	363 . . .	16,374
Frontenac	330 . . .	14,990	Norfolk, North	295 . . .	17,220
Lennox	325 . . .	16,314	Brant, South	270 . . .	21,975
Addington	2,130 . . .	23,470	Brant, North	170 . . .	11,894
Prince Edward	400 . . .	21,044	Waterloo, South	273 . . .	21,754
Hastings, East	410 . . .	17,313	Waterloo, North	280 . . .	20,986
Hastings, West	120 . . .	17,400	Elgin, East	380 . . .	28,150
Hastings, North	2,250 . . .	20,480	Elgin, West	375 . . .	14,214
Northumberland, East	490 . . .	22,300	Oxford, South	370 . . .	24,732
Northumberland, West	276 . . .	16,984	Oxford, North	415 . . .	25,360
Peterborough, East	2,960 . . .	23,956	Middlesex, East	440 . . .	30,600
Peterborough, West	190 . . .	13,310	Middlesex, West	400 . . .	21,500
Durham, East	377 . . .	18,710	Middlesex, North	446 . . .	21,240
Durham, West	330 . . .	17,555	Perth, South	344 . . .	20,780
Victoria, South	430 . . .	20,813	Perth, North	530 . . .	23,210
Victoria, North	925 . . .	13,800	Huron, South	412 . . .	23,390
Muskoka	5,220 . . .	27,200	Huron, Central	410 . . .	26,474
Ontario, South	240 . . .	20,378	Huron, North	510 . . .	27,100
Ontario, North	650 . . .	28,434	Bruce, South	690 . . .	39,800
York, East	232 . . .	23,312	Bruce, North	1,000 . . .	24,970
York, West	223 . . .	19,884	Bothwell	610 . . .	27,105
York, North	480 . . .	24,500	Lambton	830 . . .	42,616
Simcoe, South	593 . . .	26,890	Kent	667 . . .	38,826
Simcoe, North	1,130 . . .	49,238	Essex	730 . . .	46,960
Peel	280 . . .	16,337	Algoma	44,700 . . .	20,320

PUBLIC INSTRUCTION IN THE PROVINCE OF ONTARIO, 1887.

	Attendance.
Elementary Schools	5,395 (224 Catholic) 472,458
Higher	42 15,313
Total	5,437 487,771

ROMAN CATHOLIC SEPARATE SCHOOLS, ONTARIO, 1886.

Schools open.	Pupils.	Boys.	Girls.	Average Attendance.
224	29,199 . . .	14,860 . . .	15,959 . . .	16,000

PUBLIC SCHOOLS OF ONTARIO, 1886.

Schools open.	Pupils.	Boys.	Girls.	Average Attendance.
5,437	487,496 . . .	257,030 . . .	230,466 . . .	240,000

HIGH SCHOOLS OF ONTARIO, 1886.

Schools open.	Pupils.	Boys.	Girls.	Average Attendance.
109	15,344	7,907	7,437	8,800

Shipping of Port Arthur with the United States (1888): 804 vessels, of 538,174 tons.
Canadian traffic on the Sault Canal (1888): 526 vessels, of 303,384 tons.

HAMILTON—TRADE RETURNS, 1881.

Capital invested.	Hands employed.	Yearly wages.	Total value of products.
£965,000	6,500	£450,000	£1,642,000

TORONTO.

GROWTH OF THE POPULATION :—

1813	900
1834	9,254
1850	25,000
1881	86,415
1889	178,000 (with suburbs).

Imports and Exports (1888): £4,900,000.

	Vessels.	Tons.
Shipping with the United States (1888)	1,252	277,441
With other ports in Canada	3,541	720,525
Totals	4,793	997,966

OTTAWA

Lumber sawn (1888): 3,102,789 logs.
Total value of the planks, boards, &c.: £440,000.
Shipping (1888): 4,018 vessels of 793,536 tons.
Water supply: 400 gallons daily per head of the population.

MONTREAL.

GROWTH OF THE POPULATION SINCE ITS FOUNDATION :—

1672	1,509	1831	31,516
1722	3,000	1851	57,715
1765	5,733	1881	140,747
1805	12,000	1887	180,000
1821	18,767	1889	220,000 (with suburbs).

POPULATION OF MONTREAL ACCORDING TO NATIONALITIES (1887):—

Franco-Canadians	118,819
British { Irish	39,710
English	23,028
Scotch	17,555

Total 199,112

	Per cent. per thousand.
Birth-rate of the Franco-Canadians of Montreal (1888)	54·68
„ „ Irish and other Catholics	30·48
„ „ Protestants	25·16
Mortality of the Franco-Canadians of Montreal (1887)	36·14
„ „ Irish	26·89
„ „ English	22·49
„ „ Scotch	15·72

PROPORTION OF FRENCH TO OTHER RACES IN MONTREAL :—

1851	451 per thousand.
1861	482 „
1871	530 „
1881	559 „
1887	611 „

SHIPPING OF MONTREAL (1888):—

	Vessels.	Tons.
Sea-going vessels	655	782,472
Lake and river craft	5,500	861,014
Totals	6,155	1,643,486

Imports (1888) £8,300,000; Exports (1888) £5,000,000; Total (1888) £13,300,000.

GROWTH OF THE POPULATION :—

QUEBEC.

	1881.	1889.
Quebec	62,446	75,000
Lévis, St. Joseph, Lauzan, &c.	12,878	15,000
Totals	75,324	90,000
Shipping of Quebec (1876)	711,386 tons.	
" " (1885)	562,064 "	

CRIMINAL STATISTICS FOR 1886.

Convictions per provinces sentenced to

Province.	Penitentiary.	Gaol or fined.	Reformatory.	Death.	Sundries.	Total
Ontario	227	18,339	79	2	527	19,174
Quebec	135	7,190	72	—	457	7,854
Nova Scotia	24	1,402	2	—	114	1,542
New Brunswick	22	2,143	—	—	11	2,176
Manitoba	15	1,330	—	—	66	1,411
British Columbia	32	935	—	4	28	999
Prince Edward Island	—	654	—	1	3	658
The Territories	10	40	—	7	3	60

RELIGIONS OF PERSONS CONVICTED.

R. Catholics.	Anglicans.	Methodis's.	Presbyteriana.	"Protestants."	B.p'ista.
1,550	555	347	281	250	88

BIRTH-PLACES OF PERSONS CONVICTED.

England.	Ireland.	Scotland.	Canada.	U. States.	Sundries.
335	299	95	2,294	232	254

OCCUPATIONS OF PERSONS CONVICTED.

Agricul'tural.	Commercial.	Domestic.	Industrial.	Professional.	Labourers.
158	283	195	542	41	1,550

TOWNS OF THE LAURENTIAN BASIN WITH OVER FIVE THOUSAND INHABITANTS.

ONTARIO.

	Pop., 1881.	Est. Pop., 1890.		Pop., 1881.	Est. Pop., 1890.
Toronto	86,415	180,000	Chatham	7,873	9,000
Hamilton	35,961	46,800	Brockville.	7,609	10,000
Ottawa	27,412	44,000	Peterborough	6,812	9,000
Ottawa with Hull	34,302	57,000	Windsor	6,561	8,000
London	19,746	27,000	Port Hope	5,585	9,000
Kingston	14,091	18,000	Woodstock	5,373	8,000
Guelph	9,890	11,000	Galt	5,187	7,000
St. Catherine's	9,631	12,000	Lindsay	5,080	7,000
Brentford	9,616	14,000	Owen Sound	4,406	7,000
Belleville	9,516	12,000	Port Arthur	4,000	8,000
St. Thomas	8,367	11,000	Collingwood	4,445	6,000
Strafford	8,239	11,000			

QUEBEC.

	Pop., 1881.	Est. Pop., 1890.		Pop., 1881.	Est. Pop., 1890.
Montreal	140,477	225,000	Hull	6,890	13,500
Quebec	62,446	65,000	Sorel	5,791	8,300
" with Lévis	75,264	90,000	St. Hyacinth	5,321	7,800
Three Rivers	8,670	10,500	St. John	3,861	5,200
Sherbrooke	7,227	9,600			

STRENGTH OF THE ACTIVE MILITIA OF CANADA, 1888.

Province.	District.	Cavalry.	Artillery.	Infantry.	Total.
Ontario	1	187	240	4,140	4,567
	2	418	37	5,771	6,496
	3	329	205	2,973	3,507
	4	83	160	2,175	2,418

APPENDIX I.

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MILITIA OF CANADA (continued)—

	District.	Cavalry.	Artillery.	Infantry.	Total.
Quebec	5 6 7	417 — 96	552 — 350	4,070 2,430 3,606	5,118 2,430 4,052
New Brunswick	—	324	420	1,672	2,461
Nova Scotia	—	45	649	2,952	3,646
Manitoba	—	45	80	688	813
British Columbia	—	—	180	90	270
Prince Edward Island	—	—	275	342	617
R. Military College and Schools	—	43	439	597	1,079
Totals		1,987	3,208	31,506	37,474

MILITARY EXPENDITURE, 1888.

Salaries, district staff	£4,200	Construction and repairs	£17,000
Brigade-majors	2,400	Barracks in British Columbia	1,800
Royal Military College, Kingston	11,100	Care of military properties	2,500
Ammunition, clothing, and military stores	38,000	Grant to Dominion Artillery Association	400
Public armouries	10,600	Batteries, cavalry and infantry schools	86,300
Drill pay and camp purposes	56,300	Contingencies	9,300
Drill instruction	7,400	North-West service	8,100
Dominion Rifle Association	2,000		
Drill sheds and rifle ranges	2,800	Total	£260,200

STATISTICS OF THE INDIAN RESERVES IN THE DOMINION.

	1884.	1885.		1884.	1885.
Number of Indians on the reserves	88,897	85,329	Horned cattle	6,700	7,000
Extent of land under cultivation, acres	80,725	85,911	Sheep	1,800	2,000
New land made each year, acres	3,861	3,242	Pigs	7,300	8,500
Dwellings	10,712	11,509	Hay crop, tons	18,550	18,600
Barns, stables, outhouses, &c.	3,563	3,992	Grain crops, bushels	212,000	320,000
Ploughs, harrows, waggon8	5,749	6,307	Potato crop „	240,000	280,000
Other agricultural implements	20,000	18,000	Fish caught, value	£199,000	£140,000
Horses	7,300	19,600	Furs „	£66,000	£142,000
			Other industries „	£65,000	£36,000

TOTAL INDIAN POPULATION, 1888.

Provinces.	Resident.	Nomadic.	Total.
Ontario	16,903	797	17,700
Quebec	6,731	5,734	12,465
New Brunswick	1,594	—	1,594
Nova Scotia	2,145	—	2,145
Prince Edward Island	319	—	319
Manitoba and North-West Territory	23,940	10,428	34,368
Unsettled Northern Territories	—	18,054	18,054
British Columbia	17,922	22,022	37,944
Totals	69,554	55,036	124,589

THE MARITIME PROVINCES.

(NEW BRUNSWICK, NOVA SCOTIA, PRINCE EDWARD ISLAND.)

AREAS AND POPULATIONS.

Provinces.	Area in square miles.	Population, 1891.
New Brunswick	27,174	321,233
Nova Scotia	20,207	440,572
Prince Edward Island	2,133	108,891
Totals	49,514	870,696

GROWTH OF THE POPULATION FROM 1871 TO 1881:—

Total population (1871): 770,415; (1881): 870,696; increase, 13·20 per cent.

FRENCH ELEMENT (1881): 108,605; (1890): 130,000 (?)

BRITISH ELEMENT (1881):—

	English.	Scot'ch.	Irish.	Total.
New Brunswick .	83,598	40,858	100,615	321,233
Nova Scotia .	113,520	130,741	62,851	440,572
Prince Edward Island	21,404	48,933	25,413	108,891
Totals .	218,522	220,532	188,879	870,696

COLOURED ELEMENT (1881): 6,212; (1890): 7,000 (?)

NOVA SCOTIA EDUCATIONAL STATISTICS FOR 1887.

PUBLIC SCHOOLS.				
Schools open.	Pupils.	Boys.	Girls.	Average Attendance.
2,123 . . .	86,731 . . .	43,345 . . .	43,386 . . .	52,000
COUNTY ACADEMIES.				
Pupil.	Males.	Females.	Average Attendance.	
1,404 . . .	723 . . .	681 . . .	764	

NEW BRUNSWICK EDUCATIONAL STATISTICS FOR 1887.

PUBLIC SCHOOLS.				
Schools open.	Pupils.	Boys.	Girls.	Average Attendance.
1,522 . . .	59,718 . . .	32,189 . . .	27,607 . . .	34,000
GRAMMAR SCHOOLS.		NORMAL SCHOOLS.		
Pupils.	Average Attendance.	Pupils.	Males.	Females.
697	480	366 . . .	70 . . .	296

EDUCATIONAL STATISTICS FOR PRINCE EDWARD ISLAND, 1887.

Schools.	Pupils.	Boys.	Girls.	Average Attendance.
Queen's: 174 . . .	9,722 . . .	5,385 . . .	4,337 . . .	5,150
Prince: 142 . . .	7,220 . . .	4,035 . . .	3,185 . . .	3,950
King's: 121 . . .	5,518 . . .	3,026 . . .	2,492 . . .	3,000
Total 437	22,460	12,446	10,014	12,100

GROWTH OF POPULATION, NEW BRUNSWICK.

1824	74,000	1831	252,000
1834	119,000	1871	285,000
1840	156,000	1881	321,000
1851	194,000		

AGRICULTURAL PROGRESS OF NEW BRUNSWICK.

County.	Acres.	Acres cleared, 1851.	Acres cleared, 1881.	County.	Acres.	Acres cleared, 1851.	Acres cleared, 1881.
Albert . . .	435,000	32,210	61,798	Victoria and			
St. John . .	386,400	—	25,158	Madawaska	2,134,700	26,834	79,175
Charlotte . .	822,500	45,656	97,953	Westmoreland	887,300	92,822	171,090
King's . . .	877,200	120,923	189,531	Kent . . .	1,149,000	35,496	83,642
Queen's . . .	924,700	63,710	100,319	Northumberland	2,756,000	30,221	53,416
Sunbury . . .	656,000	15,587	36,902	Gloucester .	1,195,000	19,812	43,639
York	2,278,000	69,017	132,753	Restigouche .	2,072,710	8,895	21,813
Carleton . .	788,200	55,537	150,771	Totals .	17,393,410	616,720	1,253,299

AGRICULTURAL RETURNS OF NEW BRUNSWICK.

	1851.	1881.		1851.	1881.
Hay, tons . . .	225,093	414,046	Wheat, bushels .	206,635	521,956
Oats, bushels . .	1,411,164	3,297,534	Potatoes „ . . .	2,792,394	6,961,016

GROWTH OF POPULATION IN NOVA SCOTIA.

Year.			Year.		
1687	Return made by M. Meule .	900	1807	Census of Nova Scotia (Engl.)	65,000
1703	Census of Acadia (French) .	1,300	1817	" "	86,640
1707	" "	1,484	1827	" "	123,130
1737	" "	7,598	1838	" "	202,575
1749	" "	12,500	1851	Official Census .	276,854
1755	" "	9,215	1861	" "	330,857
1764	Census of Nova Scotia (Engl.)	13,000	1871	" "	387,800
1772	" "	19,000	1881	" "	440,570
1790	" "	30,000	1890	Estimated .	520,000 (?)

SHIPPING OF HALIFAX (1887):—

Entered . . .	4,153 vessels of	843,125 tons.
Cleared . . .	4,284 " "	871,987 " "
Total . . .	8,437 vessels of	1,715,112 tons.

TONNAGE OF THE CHIEF SEAPORTS OF NOVA SCOTIA AND CAPE BRETON (1888).

Halifax . . .	1,715,112	Port Hawkesbury . . .	217,435
Sydney and North Sydney . . .	1,095,218	Parrsborough . . .	189,098
Pictou . . .	517,979	Windsor . . .	146,028
Yarmouth . . .	300,068	Amherst . . .	124,269
Lunenburg . . .	261,352	Baddeck . . .	120,526
Arichat . . .	254,044	Annapolis . . .	116,738
Digby . . .	225,204	Shelburne . . .	107,354

Output of coal in Nova Scotia from 1870 to 1875: 19,153,000 tons.

" " in 1886: 1,682,924 tons.

PRINCE EDWARD ISLAND - GROWTH OF AGRICULTURE.

	Year 1871.	Year 1881.		Year 1871.	Year 1881.
Wheat . . bushels	269,000	547,000	Butter . . lbs.	982,000	1,689,000
Oats . . "	3,120,000	3,538,000	Cheese . . "	155,000	196,000
Barley . . "	176,000	119,000	Maple sugar . . "	—	25,000
Buckwheat . . "	75,000	90,000	Wool . . "	—	552,000
Potatoes . . "	3,376,000	6,042,000	Apples, grapes, &c. bushels	—	35,000
Hay . . tons	68,000	144,000			

PRINCE EDWARD ISLAND—FISHING RETURNS, 1886.

			Value.				Value.
Cod . . .	cwts.	12,850	£10,000	Halibut . .	lbs.	9,680	£116
Cod, boneless . .	lbs.	35,790	4,300	Trout . . .	„	75,000	900
Herring . . .	barrels	43,200	26,000	Smelts . . .	„	74,100	880
Mackerel . . .	„	27,500	55,000	Eels . . .	„	150,650	1,800
Mackerel, preserved	cans	679,580	13,000	Oysters . .	barrels	33,000	19,800
Haddock . .	lbs.	71,550	800	Lobsters, canned	lbs.	3,617,000	87,000
Hake . . .	cwts.	9,530	5,700				
Salmon, fresh . .	lbs.	2,440	73	Total value, including sundries .			£228,000
Alewives . .	barrels	700	420				

SHIPPING OF PRINCE EDWARD ISLAND, 1888.

Charlotte-town: Deep sea vessels . . .	1,189 of 165,035 tons.
" Coasting " . . .	6,020 " 811,655 " "
Total vessels . . .	7,209 of 976,690 tons.

Summerside: 1,426 vessels, of 639,160 tons.

CHIEF TOWNS OF THE MARITIME PROVINCES.

NEW BRUNSWICK.

	Population.		Population.
Saint John and Portland (1889) . . .	50,000	Fredericton (1886) . . .	6,218
Monckton (1889) . . .	9,000	Chatham (1886) . . .	5,000

APPENDIX I.

NOVA SCOTIA.

	Population.		Population.
Halifax (1886)	39,900	Truro (1886)	6,000
Sydney and North Sydney (1886)	9,000	Pictou (1889)	5,000
Yarmouth (1886)	8,000	Windsor	4,000

PRINCE EDWARD ISLAND.

PRINCE EDWARD ISLAND.		Population.
Charlotte-town (1886)	. . . . .	12,500

LABRADOR.

Area : 480,000 square miles; Population (1881) : 4,200.

POPULATION OF THE SIX MORAVIAN STATIONS.

Hebron	214	Rama	28
Hoffenthal	283	Zoar	128
Nain	270		
Okak	349	Total	1,272 (Behm and Wagner).

ANNUAL YIELD OF THE LABRADOR FISHERIES: -£960,000.

NEWFOUNDLAND.

AREA AND POPULATION.

Area in square miles : 40,200 ; Population (1884) : 197,335.

GROWTH OF THE POPULATION:—

1874.	1884.	1889.
161,499	197,335	205,000

POPULATION ACCORDING TO CREEDS:—

Anglicans and Wesleyans	120,411
Roman Catholics	74,651
Sundries	2,290
Total	197,352

ADULT POPULATION CLASSED ACCORDING TO PURSUITS:--

Fishers	.	.	.	.	.	.	60,500	Miners	.	.	.	.	.	.	3,600
Mechanics	.	.	.	.	.	.	3,628	Farmers	.	.	.	.	.	.	1,685

Annual yield of the cod-fisheries : 185,000 tons, or about 150,000,000 cod ; value, £3,000,000.

Seals captured in the Newfoundland waters (1831): 686,836.

„ „ „ „ (1882): 200,500.

SHIPPING OF THE NEWFOUNDLAND PORTS (1886):—

					Vessels.					Tons.
Entered	.	.	.	.	1,285	.	.	.	.	149,338
Cleared	.	.	.	.	1,013	.	.	.	.	128,088
Total	.	.	.	.	2,298	.	.	.	.	277,426

	1883.	1885.	1887.
Exports . . .	£1,470,000	£950,000	£1,080,000
Imports . . .	1,900,000	1,800,000	1,035,000

CHIEF EXPORTS, 1887.

Cod and other fish	£840,000	Sealskins	£46,000
Cod and seal oil	91,000	Copper ore	34,000
Total Exports to Great Britain (1887)			£216,000
„ Imports from „ „ „			318,000

REVENUE RETURNS.

	1883.	1885.	1886.	1887.	1888.
Income . . .	£272,000	£200,000	£216,000	£409,000	£1,430,000
Expenditure . .	247,000	275,000	347,000	348,000	1,900,000

Public Debt (1889) : £734,000.

Land under cultivation (1886) : 48,000 acres, chiefly potatoes, turnips, and other root crops.

RAILWAYS (1888) :—

	Miles.
St. John's to Harbour Grace	100
Branch line to Placentia	25
Total	125

CHIEF TOWNS.

	Pop., 1881.		Pop., 1881.
St. John's	31,000	Carbonear	3,756
Harbour Grace	7,054	Fogo and Twillingate	4,777
Bonavista	3,463		

ST. PIERRE AND MIQUELON.

AREAS AND POPULATIONS.

	Area in square miles.	Population, 1887.
Miquelon	43	574
St. Pierre	10	3,244
Other islets	1	611
Totals	54	4,429

Population during the fishing season : about 15,000.

Shipping of St. Pierre (1888) : 6,611 vessels of 412,660 tons.

	Vessels.	Tons.	Crews.
French fishing smacks	360	60,000	5,100
Local	668	14,815	4,726
Totals	1,028	74,815	9,826

Annual yield of the fisheries : 32,000 to 36,000 tons.

EXCHANGES (1888) :—

Imports	£543,000
Exports	710,000
Total	£1,253,000

REVENUE AND EXPENDITURE : about £20,000.





APPENDIX II.

CANADIAN CHRONOLOGY.

- 1494.—June. Cabot sights Primavista ; either Newfoundland, or more probably Cape Breton.
- 1497-8.—Cabot coasts the mainland of Canada and Labrador.
- 1500.—Gasper Cortereal discovers the *Terra do Bacalhao*, "Land of Cod," probably Newfoundland.
- 1501.—Gasper Cortereal visits Newfoundland and Labrador.
- 1517.—Sebastian Cabot penetrates to Hudson Bay.
- 1534.—July 14. Jacques Cartier lands at Gaspé, and explores the Bay of Chaleurs, so named by him from the oppressive heat prevailing at the time.
- 1535.—July. Cartier's second voyage.—August 10. Cartier anchors in a small inlet at the mouth of the St. John river on the feast of St. Lawrence, hence the name of St. Lawrence, which was afterwards extended to the whole gulf, and to the estuary and river as far as Lake Ontario.—September 7. Reaches the Isle of Bacchus (Orleans) and the present site of Quebec.—October 2. Arrives at the Iroquois village of Hochelaga on an eminence which he names Mont-Royal (Montreal).
- 1540.—Cartier returns with the Sieur de Roberval, appointed Lieutenant-General and Viceroy of New France.
- 1542-3.—De Roberval and his followers winter at Cape Rouge.
- 1544.—De Roberval recalled and the colony dispersed.
- 1598.—The Marquis de la Roche lands forty convicts on Sable Island, where they are abandoned to their fate for five years.
- 1603.—The twelve survivors of the Sable Island settlers are rescued.
,, Samuel de Champlain's first visit to Canada.
- 1605.—Port Royal (afterwards Annapolis) founded in Acadie (Nova Scotia) by the Baron de Poutrincourt.
- 1608.—Champlain's second voyage ; first permanent settlement of Canada ; foundation of Quebec, so named from an Algonquin word meaning "village."
- 1608-9.—Champlain winters at Quebec with twenty-eight colonists.

- 1611.—Establishment of a trading station at or near the site of Hochelaga, which had meantime been destroyed by the Algonquins after defeating and driving out the Iroquois, original masters of that part of the St. Lawrence valley.
- 1613.—Foundation of St. John's, present capital of Newfoundland.
- 1615.—Champlain ascends the Ottawa River, crosses Lake Nipissing and descends the French River to Georgian Bay and Lake Huron, returning to the St. Lawrence by Lake Ontario.
- 1620.—Permanent French population of Quebec, sixty persons.
- 1629.—July. Quebec captured by the English under Sir David Kirk, who wintered here.
- 1632.—Quebec restored to France by the treaty of St. Germain-en-Laye.
- 1635.—Death of Champlain at Quebec on Christmas Day.
- 1642.—Ville Marie on Mont-Royal (now Montreal) founded May 18.
- 1642-1667.—A chronic state of warfare, accompanied by great cruelties, between the French and their Algonquin allies on the one hand, and the Iroquois Indians on the other.
- 1667.—Population of "New France" (Canada), 3,918.
- 1672.—The Count de Frontenac appointed Governor of the Colony; population, 6,705.
- 1689.—August. Capture of Lachine by the Iroquois and massacre of the defenders, followed by the surrender of the Fort at Montreal which they held till October.
- 1692.—Population of New France, 12,431.
- 1698.—Death of Frontenac; population, 13,355.
- 1701.—August 4. Treaty of peace with the Iroquois ratified at Montreal.
- 1713.—Treaty of Utrecht, by which France surrenders to the English the Hudson Bay territory, Acadia (thereafter named Nova Scotia), and Newfoundland.
- 1720.—Population of New France, 24,134, and of St. John Island (Prince Edward Island), about 100.
- 1739.—Population of New France, 42,701.
- 1745.—Louisbourg, the stronghold of Cape Breton and key to the St. Lawrence basin, captured by the English.
- 1748.—Peace of Aix-la-Chapelle, by which Louisbourg is restored to France in exchange for Madras in the East Indies.
- 1749.—Lord Halifax founds the city of Halifax. A party of 2,544 British emigrants brought out by the Hon. Edward Cornwallis, first English Governor of Nova Scotia.
- 1752.—The *Halifax Gazette*, the first paper published in Canada, issued on March 23.
- 1755.—The Acadians, original French settlers of Nova Scotia, accused of treason and expelled. They numbered at that time about 6,000.
- 1758.—July 26. Louisbourg again captured by the English, and henceforth held by them.
- 1759.—July 26. Capture of Fort Niagara by the English under General Prideaux, who was killed during the storming of the citadel.—June 25. Commencement of the British operations against Quebec, at first unsuccessful.—September 12. Battle of the Plains of Abraham and defeat of the French by General Wolfe, who is killed in the engagement. English loss, 700, French, 1,500.—September 13. Death of General Montcalm, Commander of the French forces, who had been wounded in the battle of the Plains of Abraham.—September 18. Capitulation of Quebec to the British General Townshend. By this event the struggle for the possession of the North American continent between the two rival nations was finally decided in favour of the English. The subsequent events of the war were foreseen as inevitable.
- 1760.—April. Quebec attacked by the French General de Lévis; siege raised by the arrival of a British fleet.—September 8. Capitulation of Montreal, and completion of the British conquest of Canada, though a few Canadians still held out at the Sault Ste. Marie, between Lakes Superior and Huron. Population of Canada at the time, 70,000.
- 1762.—British population of Nova Scotia, 8,104.
- 1763.—February 10. Treaty of Paris ratified, by which France cedes and guarantees to the King of England in full right "Canada with all its dependencies." No further attempt was ever made by France after this date to recover any of her North American possessions. General Murray first British Governor-General of the Province of Quebec.
- 1764.—June 21. First issue of the *Quebec Gazette*, which is usually regarded as the first periodical ever published in any part of the British American possessions north of New England. But it was certainly preceded by the *Halifax Gazette* (1752), which, however, only lasted about two years.

- 1764.—The Pontiac Conspiracy. Pontiac, Chief of the Ottawa tribe, and a person of considerable ability, organised a scheme for a simultaneous rising among the Canadian Indian tribes and a general massacre of the English. The conspiracy was completely successful in several places, where not a single white escaped; but the timely arrival of reinforcements prevented the revolt from spreading, and it was eventually suppressed. Since that time the Indians of pure blood have mostly been peaceful, giving very little trouble to the authorities.
- 1766.—General Carleton, afterwards Lord Dorchester, succeeds General Murray as Governor-General.
- 1770.—St. John's Island (Prince Edward Island) constituted a separate Province with Walter Paterson as its first Governor. The first meeting of the House of Assembly occurred in July, 1773.
- 1774.—Passing of the "Quebec Act," which was the *Magna Charta* of the French Canadians, giving them the free exercise of the Roman Catholic religion over half a century before the passing of the Emancipation Act (1829) in Great Britain. It also secured to them the enjoyment of their civil rights, and the protection of their own civil laws and customs. By the same measure large territories were annexed to the Province of Quebec, whereby these privileges were extended over a very wide area, anticipating, as it were, the expansion of the French-Canadian race. Lastly, it provided for the appointment by the Crown of a Legislative Council, and for the administration of the criminal law as in force in England. In a word, civil law according to the old French régime, criminal according to the common law of England.
- 1775.—Outbreak of the American Revolution, immediately followed by the invasion of Canada by the American "rebels." At first they carried everything before them, and captured all places of importance. But the invasion was wrecked under the walls of Quebec, where General Montgomery's forces were routed and himself killed on the last day of the year.
- 1776.—Reinforcements arriving from England, the Americans were finally driven across the frontier, and the British supremacy never again seriously menaced.
- 1778.—First issue of the *Montreal Gazette*, still in existence; one of the oldest papers in the world.
- 1783.—Ratification of the Treaty of Paris (September 3), and definition of the boundary line between Canada and the United States; the Great Lakes, the River St. Lawrence, the 45th parallel of north latitude, the highlands dividing the waters flowing to the Atlantic from those draining to the St. Lawrence and the St. Croix rivers. This treaty subsequently gave rise to much discussion, owing partly to the prevailing ignorance regarding the region of the water-parting between the St. Lawrence and the Atlantic, and partly to the uncertainty as to the River St. Clair, which the Americans claimed to be the St. John. In 1798 the Commission appointed to decide the matter reported that the source of the northern branch of the Scodiac was the source of the St. Croix designated in the treaty. The frontier claimed by the Americans not only included a disputed tract of 10,000 square miles but would also entirely cut off the communications between Lower Canada and New Brunswick. From the source of the Scodiac they drew the line northwards to a ridge within 30 miles of the St. Lawrence, which they held to be the highlands specified in the 1783 treaty. But the British maintained that the north-west corner of Nova Scotia was at Mars Hill, about 40 miles from the source of the Scodiac, and that the north frontier of Maine should pass thence westwards over a range of hills about the sources of the Penobscot, Kennebec and Androscoggin rivers. In 1827 the question was by mutual agreement referred to the arbitration of the King of the Netherlands, whose decision (January 10, 1831) awarded most of the disputed territory to the States, but left direct communication between Canada and New Brunswick. The British Government acquiesced in this decision, but the States rejected it on the ground that the umpire had exceeded his powers. The frontier question thus remained open till the year 1842, when it was finally settled by the Ashburton treaty.
- 1784.—Population of Canada, 113,000, exclusive of the "Loyalist" immigrants to Upper Canada from the States. British population of Nova Scotia, 32,000, besides 11,000 Acadians. New Brunswick detached from Nova Scotia and erected into a separate Province with population, 11,500. Now began the immigration into Canada and Nova Scotia of the so-called "United Empire Loyalists," that is to say, those English settlers in the United States who had never joined the revolt and had remained faithful to the Crown of England. The stream of immigration continued for several years, but no accurate returns were ever made of their

numbers, which, however, are believed not to have fallen short of 40,000. The Loyalists were well received and highly favoured by the British Government, receiving large grants of land in various parts of the country. In this way extensive tracts on the banks of the St. Lawrence and round about Lake Ontario were first settled by some 10,000 Americans on lands allotted to them by the Canadian Government.

- 1785.—Re-establishment of the right of *Habeas Corpus* throughout British territory.
- 1791.—Division of the Province of Quebec into two Provinces, that is, Upper and Lower Canada, corresponding to the present Provinces of Ontario and Quebec. Each Province was to be administered separately by a Lieutenant-Governor and a Legislature comprising a House of Assembly and a Legislative Council. The members of the Council were to be appointed by the Lieutenant-Governor for life, while those of the Assembly were to be elected by the people for four years. Population of the two Provinces, 161,300 altogether.
- 1792.—September 17. First meeting of the Parliament of Upper Canada at Newark (Niagara) under Lieutenant-Governor Simcoe, the House of Assembly consisting at that time of sixteen members.—December 17. Meeting of the Parliament of Lower Canada at Quebec under General Clarke, the House of Assembly consisting of fifty members.
- 1793.—Abolition of slavery in Upper Canada.
- 1796.—The seat of government of Upper Canada removed from Newark to York ("Little York," now Toronto).
- 1798.—The name of St. John's Island changed to that of Prince Edward Island, in honour of the Duke of Kent, the change taking effect in the year 1800. Population of the Island, 4,500.
- 1806.—November. Issue of *Le Canadien*, first newspaper printed entirely in the French language. Population of Upper Canada, 70,700, and of Lower Canada, 250,000.
- 1812.—Declaration of war between Great Britain and the United States.—August 11. Detroit surrendered by the Americans under General Hull to the British under General Brock.—October 13. Battle of Queenstown Heights, below Niagara Falls, and ultimate defeat of the Americans under Colonel Van Rensselaer. Death of General Brock, shot while rallying the British.—November. Battle of Lacolle River; the American General Dearborn defeated by Colonel de Salaberry.
- 1813.—April 25. Capture of York (Toronto) by the Americans.—June 5. Rout of the Americans at the Battle of Stony Creek on Lake Ontario, six miles south-east of Hamilton.—September. Battle of Moraviantown. Retreat of the British forces and death of the Indian Chief Tecumseth.—Battle of Chateauguay; three thousand Americans under General Hampton out-manœuvred and defeated by Colonel de Salaberry and four hundred French Canadians.—September 25. Battle of Chrysler's Farm; defeat and complete overthrow of the Americans under General Wilkinson by the Canadian Militia under Colonel Morrison.—Battle of Lundy's Lane near Drummondville.
- 1814.—Ontario hotly contested, both sides claiming the advantage.—December 24. This useless bloodshed stopped by the termination of the war and the Treaty of Ghent. Since then Canada has been at peace with all her neighbours, and subject only to some internal troubles.
- 1818.—October 20. Convention of London regulating the rights of Americans in the British North American waters.
- 1821.—Commencement of the Lachine Canal to turn the rapids near Montreal and make the St. Lawrence navigable for sea-going vessels from the estuary to Montreal.
- 1831.—Population of Upper Canada, 236,700; of Lower Canada, 553,000.
- 1836.—Opening of the first railway in Canada, running from Laprairie on the St. Lawrence seven miles south of Montreal to St. John's. This line was afterwards discontinued.
- 1837-38.—Outbreak of rebellion in both provinces; suppressed in Upper Canada by the local Militia, in Lower Canada by British troops.
- 1840.—Death of Lord Durham, who was mainly instrumental in preparing the way for the subsequent union of the provinces in a common confederacy.
- 1841.—Union of Upper and Lower Canada under the name of the Province of Canada, and establishment of responsible government. The Legislature was to consist of a Legislative Council and a Legislative Assembly, each province to be represented by sixty-two members, of whom forty-two were to be elected by the people and twenty nominated by the Crown. Population

- of Upper Canada, 455,680.—June 13. Opening of the first united Parliament at Kingston by Lord Sydenham.
- 1842.—The Ashburton Treaty, by which the boundary line was settled between Canada and the United States.
- 1844.—Population of Lower Canada, 697,000.
- 1845.—Disastrous conflagrations in the city of Quebec; about 2,500 people rendered homeless.
- 1848.—The St. Lawrence canals opened for navigation.
- 1849.—Riots in Toronto and Montreal on the question of the Rebellion Losses Bill; burning of the Parliament Library at Montreal.
- 1850.—The first sod of the Northern Railway turned by Lady Elgin.
- 1851.—Control of the Postal Administration transferred from the British to the Provincial Governments, and adoption of a uniform rate of postage, viz., 3d. per half ounce, afterwards reduced to 2½d. The Census taken this year returned population of Upper Canada, 952,000; of Lower Canada, 890,260; of New Brunswick, 193,800; of Nova Scotia, 276,850.
- 1852.—Commencement of the Grand Trunk Railway, 905 miles long, completed in six years at a total cost of £17,000,000. This great artery, the "backbone of Canada," and the great international route between the eastern and western states of the Union, now represents with the affiliated lines an aggregate of over 4,200 miles, with an invested capital of nearly £57,000,000 and about 20,000 employés.
- 1853.—The number of members of the Legislative Assembly increased from 84 to 130, being 65 for each province.
- 1854.—Main line of the Great Western Railway opened for traffic, 363 miles long, cost £5,000,000. Abolition of seigniorial tenure in Lower Canada, and settlement of the Clergy Reserve question.—June 5. Reciprocity Treaty with the United States, signed at Washington, making provision for mutual rights of fishing in certain Canadian and American waters; for the free interchange of the products of the sea, the soil, the forest, and the mine. It allowed the Americans the use of the St. Lawrence river and Canadian canals on the same terms as British subjects, and gave to Canadians the right to navigate Lake Michigan. This treaty was to last ten years.
- 1856.—The Legislative Council made an elective chamber.
- 1858.—Adoption of the decimal system of currency with the dollar as unit. The city of Ottawa selected by the Queen as the capital of the Dominion and permanent seat of government.
- 1860.—The Prince of Wales visits Canada and the States, and everywhere receives an enthusiastic welcome. On August 25 he opens the Victoria tubular bridge which crosses the St. Lawrence just above Montreal on the line of the Grand Trunk Railway. This is the largest iron tubular bridge in the world, is 60 feet high in the centre and with the approaches nearly two miles in length.—September 1. Laying of the corner stone of the Parliament Buildings at Ottawa by the Prince of Wales. These buildings, together with departmental buildings, were erected at a total cost of £922,000 up to June, 1888.
- 1861.—Population of Upper Canada, 1,396,000; of Lower Canada, 1,111,500; of New Brunswick, 252,000; of Nova Scotia, 331,000; of Prince Edward Island, 81,000; of Vancouver's Island, 3,000, exclusive of Indians.
- 1866.—March 17. Termination of the Reciprocity Treaty in consequence of notice given by the United States.—June 1. Invasion of Canada by the Irish-American Fenians; Battle of Ridgeway and retreat of the Volunteers.—June 3. Withdrawal of the Fenians into the United States.—June 8. First meeting of Parliament in the new buildings at Ottawa. At this session the first resolutions necessary to effect the confederation of the Provinces were passed.
- 1867.—February 10. The British North American Act passed by the Imperial Legislature.—July 1. Union of the Provinces of Canada, Nova Scotia, and New Brunswick under the name of the Dominion of Canada. The Provinces of Upper and Lower Canada now took the names of Ontario and Quebec respectively. Lord Monck first Governor-General of the Dominion.—November 6. First meeting of the Dominion Parliament, Sir John A. Macdonald being Premier.
- 1868.—April 7. Murder of the Hon. T. D'Arcy McGee at Ottawa.—July 31. The Rupert's Land Act passed by the Imperial Government providing for the acquisition by the Dominion of the

- North-West Territories.—October 29. Hon. Wm. Macdougall appointed Lieutenant-Governor. The Red River Rebellion of the Canadian half-breeds.—November 19. Deed of surrender signed by the Hudson Bay Company to Her Majesty.
- 1870.—March 4. Thomas Scot shot at Fort Garry.—August. Arrival at Fort Garry of the expedition under Colonel (now Lord) Wolseley, when the rebels were found to have dispersed.—May 25. Fenians again cross the frontier at Trout river in the Province of Quebec, but driven back by the Volunteers.—July 15. Annexation of the North-West Territories to the Dominion, and admission of the Province of Manitoba into the Confederation. This province was formed by detaching a portion of the newly-acquired North-West Territory.
- 1871.—May 8. Ratification of the Treaty of Washington.—July 20. Admission of British Columbia into the Confederation. Population of the Dominion, 3,485,760; of Manitoba, 19,000; of British Columbia, 36,240; of Prince Edward Island, 94,000; total, 3,635,000.
- 1872.—Abolition of dual representation.
- 1873.—May 2. Death of Sir George E. Cartier in London.—July 1. Admission of Prince Edward Island into the Confederation.
- 1875.—Commencement of the enlarged Lachine Ship Canal, of all waterways constructed by Canada the most important for the development of Montreal. "This splendid work has a length of $8\frac{1}{2}$ miles. From Lachine to Côte St. Paul ($5\frac{1}{2}$ miles long) its mean width is 150 feet; the remaining distance has a mean width of 200 feet, and the greatest depth is 15 feet. The old barge canal, commenced in 1821 and completed in 1825 at a cost of £39,000, was $8\frac{1}{2}$ miles long, its bottom width was 28 feet, at water surface, 48 feet. The depth of water on the sills was $4\frac{1}{2}$ feet. The first ship canal, commenced in 1843 and completed in 1849, cost £430,000; it was $8\frac{1}{2}$ miles long, bottom width, 80 feet, at water surface, 120 feet, with 9 feet of water on sills." —(Stuart Cumberland.)
- 1876.—Opening of the Intercolonial Railway from Quebec to Halifax, distance 678 miles. This line is Government property and is worked by officials appointed by the Government. Strategically it is of vital importance to the Dominion, but as a passenger line it is too roundabout, being so constructed in order to take in the settlements and centres of rural population stretching along the right bank of the Lower St. Lawrence.
- 1877.—June 20. Great fire in St. John, New Brunswick.—November 23. Award of Halifax Fisheries Commission of the sum of £1,100,000 to be paid by the United States to the Imperial Government.
- 1879.—Adoption of a Protective Tariff in accordance with the so-called "National Policy."
- 1880.—Death of the Hon. George Brown.—October 21. Contract signed for the construction of the Canadian Pacific Railway, subsequently ratified by 44 Vic. c. 1 (1881). The Dominion had already arranged to build and work a transcontinental line, such an undertaking being considered too gigantic for private enterprise. Preliminary steps were actually taken in 1871 when surveying parties were sent to explore the almost unknown regions through which the line would have to pass. Over £700,000 were spent in this way, and between the Rocky Mountains and the Pacific Coast, where most of the engineering difficulties would occur, as many as eleven different routes with an aggregate length of over 10,000 miles were examined before a feasible system could be decided upon. "By the terms of the agreement with the Canadian Government the 'Syndicate,' or incorporated Company, undertook to lay out, construct, and equip in running order the eastern and central sections of the line by May 1, 1891; and the Government agreed to complete the unfinished portion of the western section between Kamloops and Yale by June 30, 1885, and also between Yale and Port Moody on or before May 1, 1891, and the Lake Superior section according to contract. In chartering the Canadian Pacific Railway Company the Dominion Government adopted a policy precisely similar to the one carried into effect by the United States Congress with regard to the earlier transcontinental roads, by giving both a money and land subsidy. The subsidy in money was \$25,000,000 (£5,000,000), and in land 25,000,000 acres, such land to be chosen by the Company along the route between Winnipeg and the Rockies. The Company, under the terms of the agreement, also received authorisation to mortgage its land grant for \$25,000,000 at 5 per cent., and in addition to issue a mortgage on the line on completion at the rate of \$10,000 (£2,000) per mile. The Charter also gave the Company very large additional powers, embracing

ing the right to build branches, open telegraph lines, and establish steamer lines from its terminals. The lands required for the road-bed of the railway, and for its stations, station grounds, workshops, dockground, water frontage, buildings, yards, &c., were also granted free. Whilst granting the Company the right to construct branch lines from any point within the territory of the Dominion, the Dominion Parliament agreed that for twenty years no railway should be constructed south of the Canadian Pacific Railway, except such line as shall run south-west or to the westward of south-west, nor to within fifteen miles of latitude 49 degrees (United States frontier). The properties of the Company were also made free for ever from taxation, and all material necessary for the construction and equipment of the line was to be admitted duty free; even the lands of the Company in the North-West Territories, until either sold or occupied, were also made free from taxation for twenty years after the grant thereof from the Crown. By 1882 the Company had issued \$20,000,000 (£4,000,000) land grant bonds, depositing the proceeds with the Government, which allowed 4 per cent. interest thereon, and paid the principal back to the Company as the railway construction proceeded. The remaining \$5,000,000 (£1,000,000) land grant bonds were held by the Government as security that the Company would fulfil its agreements. In 1884 the Government lent the Company \$22,500,000 (£4,500,000) for the purpose of aiding the construction of the line, which was being pushed throughout with marvellous rapidity, the Company undertaking to complete the main line by May 31, 1886. The tracks were finally joined in the Eagle Pass on November 7, 1885, and the great highway, which had cost the enormous sum of \$140,000,000 (£28,000,000), was an accomplished fact. In the spring of this year the line was being equipped, and on the evening of June 28 the first through train left Montreal, arriving at Port Moody on July 4. the journey occupying exactly 136 hours. It will thus be seen that the Syndicate, by dint of almost superhuman efforts, managed to complete this magnificent undertaking—by far the greatest feat in railway construction that the world has ever seen—in half the stipulated time, having accomplished what was generally considered at first to be not only impossible but altogether mad. By finishing the railway in 1886 the Canadian Pacific Company has given Canada five years advantage, and with the running of the first through train the benefit of the country, arising out of this new 'Queen's Highway,' commenced. It should be added that not only did the Syndicate complete the railway in half the time agreed upon, but it has honourably discharged all its obligations to the Dominion Government five years before the debt was due. Part of this Government indebtedness was paid in cash and part in land, the Government having agreed to take back portions of the land granted in the original instance at \$1.50 (6s.) per acre."—(Stuart Cumberland.)

- 1881.—April 4. Population of the Dominion, 4,324,810.—May 2. First sod turned by the Canadian Pacific Railway Company.
- 1882.—June 22. Legality of the Canada Temperance Act confirmed by the Privy Council.—August 23. The new seat of Government for the North-West Territories receives the name of Regina; it lies on a tributary of the Qu'Appelle river, and is a station on the Canadian Pacific line.
- 1885.—Outbreak of the rebellion in the North-West; commencement of hostilities at Duck Lake.—April 2. Massacre at Frog Lake.—April 14. Fort Pitt abandoned.—April 24. Engagement at Fish Creek.—May 12. Battle of Batoche and defeat of the rebels.—May 26. Surrender of Poundmaker.—July 1. Termination of the fishery clauses of the Washington Treaty by the United States.—July 2. Capture of Big Bear and final suppression of the rebellion. Total loss of Militia and Volunteers: killed, 38; wounded, 115. The rebel loss could not be ascertained, but estimated at about 30 killed and 12 wounded.—November 7. Driving of the last spike of the Canadian Pacific Railway.
- 1886.—May 4. Opening of the Indian and Colonial Exhibition in London.—June 28. First through train from Montreal to Vancouver, journey completed in five days and sixteen hours.
- 1887.—April 4. Important Conference at London between representatives of the principal colonies and the Imperial Government on the question of Imperial Federation. At this Conference the Dominion was represented by Sir Alexander Campbell and Mr. Sanford Fleming.—November 15. Meeting of the Fisheries Commission at Washington.
- 1888.—March 15. Signing of the Fishery Treaty at Washington.—August. Rejection of the Fishery Treaty by the United States Senate.

1890.—Canada supports the views of the Newfoundland Government in connection with the French fishery question, holding that the erection of lobster factories by the French on the treaty shore (the “French Shore”) is incontestably in contravention of the treaties; further, that the legal advisers of the Crown have declared such pretensions on the part of the French to be utterly groundless, and that to allow such factories to remain during the season, while at the same time preventing the erection of any fresh ones by the British unless an equal number is permitted to the French, is a concession most prejudicial to any future settlement, as far as the interests of the Colony are concerned; lastly, that the *modus vivendi*, having been arranged without the consent of the St. John’s Legislative House of Assembly, is a violation of the rights granted by the British Government to the people of Newfoundland in the year 1857.





APPENDIX III

THE CANADIAN NORTH-WEST TERRITORIES.

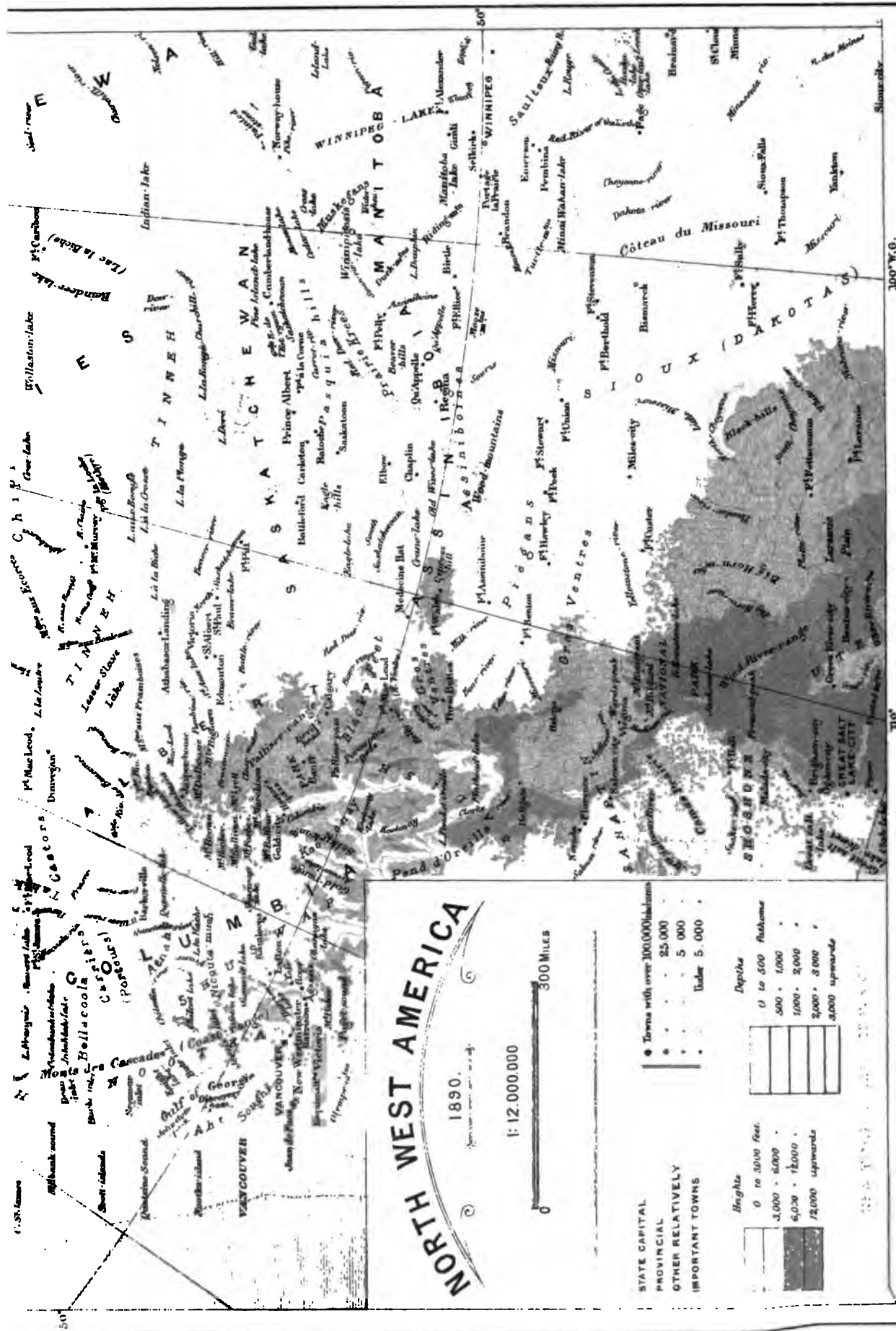
(Communicated by Mr. J. G. Colmer.)

ONLY a few years ago that part of Canada now called Manitoba and the North-West Territories—the latter with its divisions of Assiniboia, Saskatchewan, Alberta, and Athabasca—was known as the Hudson Bay Territory, or Rupert's Land, and to the world, outside the officers of the Hudson Bay Company, it was little more than a geographical expression, so meagre was the knowledge that existed of the fertility of its soil, and of its mineral and other diversified resources. It is true that much of the country had been partially explored by Palliser and Hinde, and that a Select Committee of the House of Commons had been engaged in collecting evidence regarding it; but the subject was not one that created any great enthusiasm at the time, and the question of its being opened up for settlement, and for the use of mankind, remained in abeyance until the formation of the Dominion came about in 1867, when the young and vigorous confederation very soon initiated the negotiations which finally led to the transfer of nearly three millions of square miles, and hundreds of millions of acres of fertile land, to the united provinces of British North America.

RATE OF DEVELOPMENT OF THE COUNTRY.

The object of this short paper will be to endeavour to show with what energy and enterprise this country has been, and is being, developed, and the advantages that are likely to follow its rapid settlement by the overcrowded populations of Europe. To make such a territory accessible is after all the most practical way of utilising for the public good the geographical knowledge placed at our disposal by the intrepid explorers who invariably precede the march of civilisation. The knowledge that now prevails upon the subject, and the rapidity with which the population has augmented by the aid of immigration, are in themselves no mean evidences of the capacity of Western Canada to sustain a large number of inhabitants.





THE CANADIAN PACIFIC RAILWAY.

The story of the inception of the Canadian Pacific Railway, of the difficulties that were experienced, one after another, before it was taken in hand by the present Company (1881), and of its final completion from ocean to ocean in the winter of 1885, are now matters of history, familiarised to us by the comparative recent date of their occurrence, and by frequent repetition. The country surveyed extended from Ottawa to the Pacific coast, and from Port Simpson to the Fraser River, and the work involved an outlay of at least 3,000,000 dollars. These surveys were followed by a more general examination of the land available for settlement, north and south of the line, on a system laid down by legislation. The country was mapped out in townships of six miles square, containing thirty-six sections of 640 acres each, and a large area has been actually inspected. Copies of the sectional and township diagrams are now deposited in the offices of the High Commissioner for Canada in London, which show the general character of the land in question, and contain the surveyors' notes of their examination. So complete are these maps that it is a question whether such a mass of information, about so large an area of land, is accessible in so small a compass for any other country. These surveys will be continued from year to year, as the necessity for opening up more country for settlement arises.

It is estimated that the Canadian Pacific Railway has cost Canada about £14,000,000, exclusive of the land grant of about 18,000,000 acres. To this may be added the cost of the Intercolonial Railway, a part of the through system from the Atlantic to the Pacific, say nearly £7,000,000, and there has also been spent upon the development of the North-West, and upon the land in that part of Canada, another £1,250,000. Therefore the acquisition and development of the country, for national and imperial purposes, has at a moderate computation required over £22,000,000, representing an annual outlay, for interest, of nearly a million sterling. No financial aid was given by the Imperial Government.

CANADA AND AUSTRALIA.

A regular line of fast vessels will soon be steaming between British Columbia and Asia, and, it is believed, before long between British Columbia and Australia. It is also regarded as being only a question of a few years when Canada and Australia will have direct telegraphic communication. All these things are the direct outcome of the development that has been taking place in Manitoba and the North-West, and add considerably to the significance of that great work.

MANITOBA AND THE NORTH-WEST.

Manitoba and the North-West are estimated to contain an area of about 2,700,000 square miles. The character of the country is that of a plain, rising in three steps of different altitudes, from the 95th degree of west longitude to the Rocky Mountains. It is well watered by large rivers, the principal streams in the district inhabited at present being the Assiniboine, North and South Saskatchewan, Red, Bow and Pelly Rivers, with their many tributaries, while lakes, large and small, are to be found scattered everywhere. In the more northern districts, there are the Peace and the Mackenzie Rivers, both of them of great volume. A good deal of misapprehension, arising from misunderstanding,

exists about the climate. The winters are severe, but are not in any way injurious to health. Very much the same tales were told years ago about the climate of Eastern Canada, that are now related about that of the West. The former is now regarded as one of the best parts of the Continent for all general agricultural purposes, and time is daily showing up the climatic libels that have been perpetrated about the latter, and demonstrating its healthiness and suitability for all the needs of human existence. Not so much is now said against Canada as formerly, and this is largely attributed, in the Dominion, to the visit of the British Association five years ago, when the members were able to see it for themselves, and to form their own opinions as to the varied nature of its productions. The settlement of Manitoba and the North-West Territories has been much facilitated by the discovery of the immense beds of lignite, bituminous, and anthracite coal, that are now known to underlie an immense district stretching from the Pacific coast to from 150 to 200 miles east of the Rocky Mountains. Coal is being raised at Lethbridge near Fort McLeod, and at Banff in the midst of the mountains, and a good supply of this article—indispensable where the winter is severe—is now assured at reasonable prices. As already stated, the country is very well watered, and irrigation, which is a drawback in many parts of the world where there are any large areas of vacant land, is not necessary. Not only are there plenty of rivers and lakes, but in most parts of the country good water is found at a reasonable depth from the surface. It is not intended to assert that North-West Canada is without any disadvantages, but the worst character it can be given is that it is subject to some of the vicissitudes of temperate climates, and the best proof of its suitability is found in the increase in the settlement that has taken place.

A HOME FOR AGRICULTURISTS.

As a result of the enterprise to which reference has been made, it is not surprising to learn that the population of Manitoba, the North-West Territories, and British Columbia, has, within the last twelve or fourteen years, risen from a few thousands to probably over 300,000. The new arrivals have come partly from the eastern provinces of Canada, and from the United States, but a very considerable number consists of emigrants from Great Britain and Ireland, and from the Continent, several flourishing settlements of foreigners having been formed along the line of the railway. At present, the principal industry in which the people are engaged is agriculture, the climate and soil having proved to be exceptionally favourable for both arable and pastoral farming. In this connection, a reference may be made to a recent speech of General Butler, a well-known American Senator, in which he said that Canada has twice the extent of available wheat land possessed by the United States, and that it will produce twice the number of bushels of wheat per acre, on an average, compared with the yield in the great republic. The country is, however, known to be rich in minerals of various kinds, and it also possesses, in parts, great wealth in timber. These resources, in the near future, are likely to receive the attention of capitalists, and to provide employment for the labourer. The effect of the development of the country has been to largely augment the trade of the Dominion, supplies having had to be brought in for the railways, and for the settlers, and as it becomes more thickly populated, the effect upon the quantity of the goods exported from Great Britain to the Dominion is sure to be considerable. Then again, the area under cultivation and occupation, owing to the liberal land regulations that have been inaugurated by the Canadian Government, is increasing year by year, and there can be little doubt that

the surplus of its bountiful products available for export, after supplying the home consumption, will rapidly increase, so that the country will soon become an important factor in the food supplies of Eastern Canada, and of Great Britain. Land, no matter how fertile it may be, is not of much value unless it is accessible to settlers, and unless its products can be marketed with facility and cheapness.

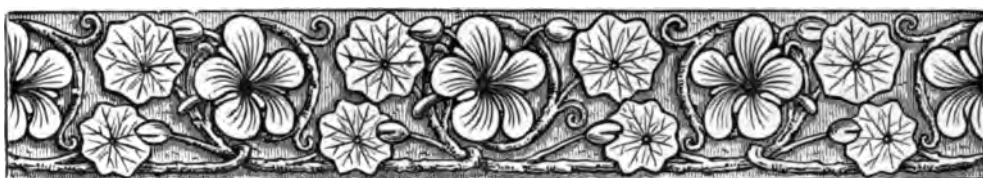
ADVANTAGES OFFERED TO SETTLERS.

Now that this condition of things may be said to exist in the country in question, it may not be out of place to explain briefly the conditions under which the land may be obtained. The terms are probably more liberal in Canada than in almost any other country in the world. Free grants of 160 acres may be obtained by any settler the head of a family, or by any male over the age of eighteen years, on the sole conditions of residence for three years, the cultivation of a reasonable portion within that time, and the erection of a suitable house. A modification of these regulations is also in force under which a settler need not reside continuously upon the homestead for the first two years; and, in these circumstances, a title may be obtained in five years. These free grant lands are equal in quality and in position to any of the other lands that will subsequently be mentioned. As already explained, the country is surveyed into townships of six miles square, each containing thirty-six sections of one mile square. The alternate sections are available for free grants. Most of the land in the other sections belongs to various railway companies, to the Hudson Bay Company, or to Land Corporations, and may be obtained at prices ranging from 8s. to £2 per acre, according to contiguity to railway communication and settlement.

Several experiments, both on the part of companies and individuals, and indeed of the Imperial Government, in connection with the crofters, are now on trial in Manitoba and the North-West Territories, and their progress will be watched with interest. In this connection it may be mentioned that the president of the section is an authority on colonisation, having been connected with the experiments commenced on his return from occupying a high official position in Canada. If it can be shown, and it is believed to be possible, that persons, properly selected, and started in this way, can succeed in making a living and in repaying the capital advanced to them with interest, a great and perplexing social question will have been satisfactorily solved. It is early yet to speak positively, for hardly any of the settlements, although progressing favourably, can be said to be in the position of having succeeded, so far as returning the money advanced is concerned, except in the case of the Mennonites who went to Canada some years ago, and who have entirely repaid the money lent to them. The experience that has so far been obtained makes it very doubtful, however, whether the money that may be advanced upon the security afforded by Canadian legislation is sufficient to enable a family to start successfully upon 160 acres of land. It has been suggested by Sir Charles Tupper that the sum should be increased to £180, which it is claimed would not only put any possibility of failure, in the majority of cases, out of the question, but would improve the security—£180 being secured upon the homestead of the head of the family and upon that taken up by an individual member thereof. In other words 320 acres would be given as security for £180, as against 160 acres for the £120. In addition, what is even more important, it would enable the advances to be repaid more quickly than at present, and thus make the money available for the assistance of further families. In

such a short paper it is only possible to touch the fringe of so extensive and so important a geographical matter as the opening up and development of a new country extending from the 49th parallel to the far north. Nothing has been said as to the recent discussions upon the Mackenzie River district, and its reported immense and varied resources, or about the country that would be affected by the opening up of the Hudson Bay route, when that comes to pass ; but it is hoped that enough has been said to show that a fertile country of great extent, practically unknown some twenty years ago, has, in that period, been opened up for habitation, and that the foundation has been laid for bringing the vacant lands now awaiting cultivation and occupation into the use for which Providence destined them, and, at the same time, providing homes and sustenance for the congested populations of the Old World.





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